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### FRACTURES IN THE REGION OF THE ELBOW JOINT.<sup>1</sup>

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In presenting this paper this evening I am aware of the fact that I am giving you little that is new. The subject is, however, at any rate to me, one of great interest, and to the practitioner of no little importance. These fractures are common in childhood and frequently present problems associated with considerable worry to the practitioner; if this paper can give some help in the elucidation of these problems, or provoke some discussion and stimulate thought on the subject, it will have served its purpose.

<sup>1</sup>Read at a meeting of the South Australian Branch of the British Medical Association on February 25, 1937.

At the elbow joint the lower end of the humerus articulates with the upper end of the radius and ulna. This complicated articulation comprises three joints with a single synovial cavity. First, we have the radio-humeral joint, in which the shallow cup-shaped upper surface of the radial head receives the capitellum of the humerus. Secondly, the ginglymus joint between the trochlea of the humerus and the olecranon, which may be spoken of as the ulno-humeral joint. Lastly, there is the superior radio-ulnar joint in which the head of the radius rotates within the osseo-ligamentous cuff formed by the lesser sigmoid of the ulnar and the orbicular ligament.

As will be realized from this brief outline, the proper functioning of the joint is very largely dependent upon the integrity of the cartilage covered surfaces of the three bones entering into the joint and the preservation of their correct shape; factors producing changes in these structures will cause interference with joint function.

The lower end of the humerus is flattened and curves forward in its relation to the shaft.

The plane of the lower articular surface of the humerus passes outwards and slightly downwards, being inclined at an angle of about  $10^\circ$  from that at right angles to the long axis of the humerus. In the extended position, therefore, the ulna does not continue down the line of the humerus, but is inclined outwards at about  $10^\circ$ . This is known as the "carrying angle" and is most evident with the forearm in supination, because with pronation the radius swings inward around the ulna and apparently obliterates the angulation, but the line of the ulna and humerus, of course, remains unchanged. The correctness of the carrying angle, the preservation of which is necessary for the proper functioning of the extremity, can accurately be judged therefore, only with the forearm extended and supinated—a fact that will be referred to again later.

The plan of ossification of the lower end of the humerus, and upper end of the radius and ulna, must be kept in mind when interpreting X ray pictures of this region.

Three important mixed nerves come into close relationship with the lower end of the humerus: the ulnar, median and musculospiral. Of these, the ulnar, occupying its vulnerable position in the post-condylar groove behind the internal epicondyle, is the most frequently injured. Next in order of frequency is the median, and least commonly injured is the musculospiral. In Table I are details of seventeen nerve lesions associated with fractures around the elbow joint reported by Platt.<sup>(1)</sup>

TABLE I.

Type of Fracture.	Ulnar.	Median.	Musculo-spiral.	Posterior Inter-osseous.
<i>Humerus</i> —				
Supracondylar ..	4	4	2	
Internal epicondyle ..	2			
External condyle ..	3 (late palsy)			
<i>Ulna olecranon</i> ..	1			
<i>Radius head</i> ..				1 (late palsy)
Total ..	10	4	2	1

The brachial artery crosses the line of the articulation and bifurcates opposite the neck of the radius into the ulnar and radial. It can be compressed or even divided by the spike of the lower end of the upper fragment in supracondylar humeral fractures.

The venous return from the flexor muscles of the forearm converges to one main profunda vein which, piercing the deep fascia, joins the median vein at its bifurcation in front of the bend of the elbow. This may readily be obstructed by the

pressure of displaced bone, or by the hæmatoma which forms and is tightly compressed in the ante-cubital fossa by the tense bicipital fascia in cases of supracondylar fracture; this is an important factor in the production of Volkmann's ischæmic contracture, and will be referred to later.

Of all joints in the body after injury the elbow most of all resents forced passive movements and massage, and this is a point which must be firmly kept in mind in treating these fractures.

Years ago Sir Robert Jones<sup>(2)(3)</sup> altered the whole outlook on results of treatment of fractures in this region by his advocacy of treating them all with the elbow fully flexed; that is, with the exception of fractures of the olecranon. He avoided passive movement during the stage of recovery, and employed Thomas's functional test of recovery.

#### Classification of Elbow Fractures.

Elbow fractures may be classified as follows:

##### A. Lower end of humerus.

###### 1. Supracondylar:

(a) Extension type, the common fracture in children.

(b) Flexion type, uncommon, occurs in adults.

(c) Comminuted—"T", "Y"-shaped fractures, occur in adults and are a variety of (b).

2. External condyle, occur in children of two to ten years.

3. Internal epicondyle, occur in persons between six and sixteen years.

4. Fracture of capitellum, occurs in adults.

##### B. Upper end of radius.

1. Fracture of head of radius.

2. Neck of radius.

##### C. Upper end of ulnar.

1. Fracture of olecranon.

2. Fracture of coronoid process.

#### Supracondylar Fractures of the Humerus.

Supracondylar fracture of the humerus occurs most commonly in children. It is the commonest fracture in this region and one of the commonest fractures sustained by children. Large numbers are seen in the out-patients' department of children's hospitals. Although looked upon in the past and even now by some practitioners as being difficult to treat and yielding unsatisfactory results, with good reduction and correct treatment the results are almost uniformly good.

In this fracture the humerus yields at the weak spot just above the condyles where the triangular shape of the humeral shaft is weakened by the olecranon fossa. In the diacondylar variety of this group the fracture line traverses one or both condyles. Supracondylar fractures in the older textbooks were frequently referred to as the separation of the lower humeral epiphysis. True epiphysiolysis in this region, however, is very rare, and what appears to be a separated epiphysis in the X ray photograph, on closer examination, if the immaturity of the ossification is borne in mind, is found to be in reality a supracondylar fracture of the diaphysis.

Supracondylar fracture is customarily divided into (a) the extension type, the common variety,

in which the lower fragment is displaced posteriorly, and (b) the flexion type, in which the lower fragment is displaced forwards, this latter type being extremely uncommon.

In the common extension type of supracondylar fracture which is caused by the child falling with extended elbow onto the outstretched hand, the lower fragment consisting of a variable amount of the lower part of the diaphysis of the humerus and carrying with it the epiphysis is displaced backwards, and the lower end of the upper fragment, that is, the shaft of the humerus, forms a spike projecting forwards into the region of the ante-cubital fossa. This is well illustrated in a lateral radiograph. Of equal importance, however, is the lateral and rotary displacement, which is frequently present and which can be seen only in an antero-posterior view.

Clinically the appearance presented is not unlike that of a posterior dislocation, but by palpation the three bony points are found to be correctly orientated.

Owing to the extreme laceration of the *brachialis anticus* muscle by the forwardly projecting spike of the upper fragment, considerable extravasation takes place, and the region in the course of twelve to twenty-four hours becomes very swollen; the swelling greatly interferes with reduction of fractures which are left for any great length of time.

Of the complications connected with supracondylar fractures, the most dreaded is Volkmann's ischaemic contracture.

As previously mentioned, the venous return from the flexor forearm muscles may be fairly suddenly and completely blocked by compression of the profunda vein in the ante-cubital fossa, and following the experiments of Brooks<sup>(4)</sup> in 1922 and Jepson<sup>(5)</sup> at the Mayo Clinic in 1926, this is generally accepted as being the primary event in the pathogenesis of this condition. More recently S. G. Jones,<sup>(6)</sup> of Boston, has shown that obstruction of the arterial circulation also occurs in these cases, and this he considers to be the main cause. Immobilization in acute flexion, and especially if the fracture has not been adequately reduced, favours the venous obstruction. When Sir Robert Jones advocated so strongly treatment of supracondylar fractures in flexion, he did not mean the position to be that of tight acute flexion, and this misunderstanding has led to quite unjustified condemnation of the method. Reduction in volume of the radial pulse is common in supracondylar fracture, either before or after reduction, and the pulse may be found to be completely absent. If the fracture is accurately reduced, the pulse usually returns in the course of twenty-four to forty-eight hours. The brachial artery may be pressed upon or even divided by the projecting spike, or the obstruction may be caused by pressure of hematoma; and absence of the radial pulse, although not necessarily indicating impending ischaemia, is at least warning that there is considerable tension in the ante-cubital fossa.

An extremely rare sequela of circulatory obstruction connected with supracondylar fracture is gangrene of the fingers or even of the whole hand. I saw a case of gangrene of the hand following supracondylar fracture in Mr. Harry Platt's clinic at Manchester; the hand had to be amputated just above the wrist.

Involvement of median, ulnar or musculospiral nerve may occur with supracondylar fracture.

The nerve lesion may be primary, that is, produced at the time of the initial trauma by contusion or stretching, or secondary, arising in the third or fourth week. This secondary lesion is especially seen in the ulnar nerve through alteration of its groove with anchoring of the nerve. It is more liable to occur if in contravention of all principles of correct therapy the joint is subjected to forced passive movements during convalescence. Primary ulnar lesions may also occur. Primary median lesion may occur through the nerve becoming injured by the spike of the upper fragment at the time of the injury or later by injudicious pressure in this region during reduction of the fracture. The median nerve may later become adherent to the spike in unreduced fractures, becoming stretched or frayed by movements of the elbow, and a secondary lesion may thus be produced. Primary lesion of the musculospiral nerve may occur in the presence of considerable lateral displacement of the lower fragment.

In the great majority of cases of nerve involvement recovery takes place spontaneously without operative interference in the course of four to six months. In severe median or musculospiral lesions without early signs of recovery and with the X ray appearance of the fracture suggesting serious damage to the nerve, exploration is, I think, advisable. It is the usual Liverpool practice, however, to wait four to six months before exploring.

Nerve involvement is common in association with Volkmann's ischaemic contracture. Platt<sup>(1)</sup> considers that in these cases, in addition to bony involvement, the nerves may be pressed on by the fibrosis of the muscles, the median as it passes between the two heads of origin of the *pronator teres*, and the ulnar as it passes between the two heads of origin of the *flexor carpi ulnaris*. McMurray,<sup>(7)</sup> finding that in Volkmann's contracture the signs of nerve involvement are frequently confined to anaesthesia of the tips of the fingers, thinks that the nerves are affected, like the muscles, by the circulatory obstruction.

*Myositis ossificans* may occur in connexion with supracondylar fractures, but with nothing like the same frequency as after dislocations at the elbow. I shall not discuss this complication any further than to say that rest is indicated, and that the very worst treatment is forced passive movements.

#### *Treatment of Supracondylar Fractures.*

The sooner the fracture is reduced, the better. After a study of the X ray films (I need hardly mention that good antero-posterior and lateral films



are essential), the fracture is reduced under a general anaesthetic. Local anaesthesia for this type of fracture, occurring as it does so often in children, is not applicable nor desirable. The elbow is extended and the lateral and rotary displacement is corrected, the correctness of the carrying angle being easily judged with the limb in the extended supinated position. Traction is exerted, and the backward displacement is reduced by pushing upwards and backwards on the lower end of the humerus, held just above the fracture with the other hand. This traction and counter-traction must be maintained while the elbow is flexed until the hand rests against the neck. The fracture is then immobilized in a position of flexion; flexion should be just short of being acute, and the test of this is that the hand can still be pushed up another inch or so. Fixation is effected by means of the cuff and collar, the wrist being suspended just below the chin, with the hand resting on the opposite shoulder.

Circular bandages or strapping to maintain this position should not be used. At Platt's clinic a dorsal plaster slab is added to prevent recurrence of lateral displacement. In the presence of much swelling this position of full flexion cannot be obtained straight away. In these cases as much flexion as is safe is obtained, the child is kept recumbent, and the flexion is gradually increased as the swelling diminishes, until the required position is obtained. A watch must be kept upon the radial pulse, the colour of the fingers is noted, and attention is paid to any complaint of pain in the fingers. Needless to say, movements and sensation must be checked periodically to ascertain the presence or absence of nerve involvement. Remember that severe pain in the fingers is frequently the first sign of impending ischaemia. After reduction, skiagrams, both antero-posterior and lateral views, must be taken to check the position. If the position is unsatisfactory, another attempt at reduction may be made. If great swelling has taken place in the meantime, or if reduction is made difficult on account of the patient being seen late, it may be impossible to alter the position, and, in fact, unwise to make the attempt. No great harm comes if the position is not perfect, if the subsequent régime is correct.

CASE I.—On August 28, 1933, I was called to see a boy, aged nine years, who had fallen and sustained a supracondylar fracture of the right elbow. Diagnosis was made clinically. Although the patient was seen within one hour of the accident, the radial pulse could not be felt in any position of the forearm, from flexion down to full extension. Only moderate swelling of the elbow region was present. He was immediately given an anaesthetic and the fracture was reduced; in doing this no difficulty was encountered. Owing to the absence of the radial pulse, the boy was admitted to hospital for observation. During the night the forearm was lowered to below a right angle, and another skiagram taken in the morning showed the deformity to have recurred. The radial pulse was still not perceptible. An attempt to improve the position was made this day, but as shown in the skiagram the attempt was only partially successful. The elbow was maintained in as much flexion as was deemed safe, with the colour of the hand remaining good, and he was kept in bed with the elbow elevated on a pillow. On the third day the

pulse returned, and as the swelling subsided the elbow was flexed a little more. Treatment followed along the lines to be described. After three months he had almost a full range of flexion, but extension was limited by about 25°. I examined this boy again last month, three years and four months after his injury, and the function of the arm was normal, full extension being present.

It is most important to correct the lateral displacement. Later on, if reduction is imperfect, the projecting spike can be removed if causing trouble, or an osteotomy of the humerus may be done if lateral displacement has produced too great an alteration of the carrying angle.

After about three weeks of maintaining the elbow in flexion, and when tenderness around the fracture has disappeared, the forearm is dropped a few degrees by increasing the length of the sling. The patient is seen again in three days, and if he can voluntarily flex the elbow to its original position, the forearm can be still further lowered; if not, a further period of immobilization is required. This follows out Thomas's test of recovery. By degrees, every third day, the forearm is gradually lowered. During this time the patient practises active movements of the elbow, flexing and then allowing the forearm to drop down to the limits allowed by the sling. Active movements of the fingers and wrist have, of course, been carried out from the very beginning. When extension to about 130° has been obtained by this gradual process, the sling is discarded, and the patient gradually recovers full extension by his own unaided efforts with ordinary use of the arm. No massage or assisted movements are required. Recovery of movement is not helped by such things as carrying weights *et cetera*, or hanging from horizontal bars; rather is it hindered. It is a common thing to find that the patient is being subjected to forced passive movements, thereby causing much pain and complications, such as synovitis of the joint, secondary ulnar neuritis or *myositis ossificans*, and that the joint is becoming more and more stiff. When this maltreatment is stopped and the elbow is put at rest and then treated under the Thomas régime, recovery takes place.

The "cuff and collar" method of fixation is used as a routine in Liverpool, and was adopted by Sir Robert Jones from the "cord gauge halter" of Hugh Owen Thomas.

In one of Thomas's original monographs published in 1887<sup>(8)</sup> the "gauge halter" and his "test of recovery" are illustrated diagrammatically. The following paragraph appears on page 82 of this monograph:

In the treatment of lesions of the elbow joint, whether from injury or disease, the mechanical means to which I almost totally trust is the "gauge halter", applied as before described, sealed and NEVER VARIED in length from the commencement of treatment, until special signs appear, whether that be a short or long period.

I have described the details of treatment of this fracture in children at some length, because if these details are correctly carried out excellent results invariably follow in these fractures which otherwise can cause much trouble and worry.



With regard to the treatment of supracondylar fractures in children by open operation, it has been stated by several authorities (Girdlestone<sup>(9)</sup> and Fagge<sup>(10)</sup>) that if satisfactory reduction has not been obtained by the first manipulation and there is much swelling of the elbow, it is safer and more satisfactory to perform an open reduction. The fracture is approached from behind, the triceps is split, the fragment is levered into position, and at the same time the blood clot which is menacing the circulation can be removed. No internal fixation is required, and the elbow is treated in flexion as before. This may be so, but I personally have no experience of open reduction in this type of fracture in children, and consider that the indications must be very limited; I would invite discussion on this subject.

With regard to Volkmann's ischaemic contracture, let us consider first the prophylaxis. Early and accurate reduction of the fracture is of paramount importance in preventing this complication. Putting up the elbow in full flexion without reducing the fracture is very dangerous. Bandaging, strapping, splints and circular plaster of Paris should not be used to retain the flexed position. The danger signals, great pain, swelling, cyanosis and lividity of the fingers and obliteration of the radial pulse, must be carefully watched for.

Then, in the treatment of impending ischaemia, for example, in an early case within a few hours of the fracture, at the first sign such as severe pain and loss of movement in the fingers, with obliteration of the radial pulse, the elbow should be lowered to a right angle; needless to say, it should be released from all restraint likely to cause vascular obstruction, and the patient should be placed in bed with the elbow elevated on a pillow. If the condition has not improved, the arm can be still further lowered; we must risk the slipping of the fragments for the time being, since prevention of ischaemia is in the circumstances far more important than the fracture. If the condition still does not improve, the bicipital fascia at the bend of the elbow should be incised, blood clot in this region evacuated, and the condition of the artery investigated.<sup>(11) (6)</sup>

In the rare flexion type of supracondylar fracture the reverse displacement of the lower fragment is present, that is, forwards. This fracture is caused by the child falling on the point of the elbow. The reduction of this fracture is, as a rule, easy, but the difficulty is to maintain the position. If put up in flexion the lower fragment very frequently again rides forward and an optimum position must be found. Often this is right angle flexion. Some of these fractures are best put up in extension in an arm splint of the Thomas type with light traction. There is, as a rule, no difficulty in subsequently obtaining a full range of flexion.

This flexion type is the commoner type of supracondylar fracture in adults, and in them probably the most satisfactory method of treatment is that of Böhler.<sup>(12)</sup>

The fracture is reduced in the screw traction apparatus, with the elbow flexed to a right angle and the forearm in pronation. This pronation relaxes the *pronator teres*, and prevents this muscle from pulling the short lower fragment into a varus position. An unpadded plaster cast is then applied with the traction wire through the olecranon *in situ*. As soon as the cast is set, the screw traction apparatus and wire are removed, the arm is placed upon an abduction frame and light traction is maintained by strapping applied to the plaster enclosing the upper arm. In this way the extension force acts upon the extensor surface of the forearm.

This method of treatment is, of course, reserved for the more difficult fractures in adults; it is quite unnecessary and undesirable in children.

"T" and "Y"-shaped fractures of the lower humeral end occur in adults as a comminuted variety of the former fracture. They are caused by falls on the elbow, the olecranon acting as a wedge, dividing the lower fragment into two or more pieces.

The fracture line enters the joint, which fills with blood, and the whole region becomes very swollen. Disciples of Arbuthnot Lane and Hey Groves found great scope for their ingenuity in devising variously shaped tri-radiate plates to hold the fragments in position. Some very pleasing carpentry can be done in these cases, screwing the fragments into a perfect position. Unfortunately, the elbow joint resents foreign bodies, and the results are nearly always marred by complete stiffness of the elbow.

These fractures may be treated by Böhler's method as outlined above. The Liverpool method of treating these fractures is to obtain as much correction as possible by traction and lateral compression of the fragments, and then to put the fracture up with the elbow at just slightly less than a right angle. Frequently nothing like complete reduction can be obtained, and considerable thickening remains around the joint. The patient, however, usually ends up with a very useful, strong arm, with a fair amount of movement. In the worst cases, those with practically no movement as an end result, an excision may be considered if the patient is willing to sacrifice stability for movement.

Compound fractures are treated upon the usual lines.

#### Fracture of the External Condyle.

I shall now pass on to that interesting fracture which occurs in children between the ages of two and ten years, that is, fracture of the external condyle.

To understand this fracture fully a brief consideration of the plan of ossification of the lower end of the humerus is again necessary.

If we consider the line of fracture in the case of a child aged about six years, we find that ossification, commencing in the capitellum in the second year, that is, the centre for the capitellum and half the trochlea, has proceeded to a certain extent. The centre for the internal epicondyle has just

appeared, and the rest of the epiphysis is cartilaginous. The line of separation in this fracture usually includes a very small flake of the diaphysis, and continues down through the trochlea. The fracture is caused by falling on the outstretched hand, force transmitted up the radius to the capitellum shearing off the fragment. The external epicondyle gives common origin to the extensor muscle mass of the forearm, and the pull of these muscles rotates the fragment, so that the articular surface now looks inward against the fractured surface of the shaft, and the fractured surface outwards under the skin. Owing to the constant pull on the common extensor origin, the fragment cannot be satisfactorily manipulated into position, and if it is left, non-union will result. The detached fragment forms an unsightly projection under the skin on the outer side of the elbow, but this is not the main disability. As a result of the displacement of the outer half of the humeral epiphysis, increasing *cubitus valgus* develops.

Owing to this great increase in the carrying angle, in later years, the ulnar nerve running in the post-condylar groove becomes stretched like a bow-string at each flexion of the elbow; a friction neuritis develops, the nerve becomes thickened, there occurs a late or tardy neuritis as described by Mouchet<sup>(13)</sup> and Platt.<sup>(14)</sup> The correct treatment in these cases is to cut down on the fragment and to replace it in position. One or two catgut sutures suffice to hold it. A limited exposure is all that is necessary, as much as possible of the ligamentous connexions of the fragment being retained.

An interesting fracture of the capitellum occurs in adults. The mechanism of production is not quite clear, but I think it is similar to that producing the preceding fracture in children, that is, force transferred to the capitellum through the radius, a fall on the outstretched hand. The anterior half of the capitellum is split off.

This may be rotated up as on a hinge at its upper part or completely displaced upwards onto the anterior surface of the shaft of the humerus. If these cases are seen early the fragment can usually be manipulated into position, and the position is easily maintained by flexion of the elbow.

If manipulation is unsuccessful, the fragment should be excised. Injury to cartilage of the capitellum in cases which show no demonstrable fracture is probably responsible for the interesting condition of *osteocondritis dissecans*, with the production of loose bodies in the elbow joint analogous to the more common condition in the knee joint.

#### Fracture of the Internal Epicondyle.

We now pass on to fracture of the internal epicondyle. The centre of ossification for the internal epicondyle appears at the fifth year. A tongue of diaphysis grows down and separates this epiphysis from that of the trochlea, capitellum and external epicondyle. These latter epiphyses fuse at about the sixteenth year and unite with the shaft about the

seventeenth. The epiphysis for the internal epicondyle fuses with the shaft about a year later. Between the ages of six and sixteen years, therefore, the epiphysis of the internal epicondyle forms a separate mass of bone which may become separated by an abduction strain of the forearm on the upper arm. This epiphysiolysis or sprain-fracture frequently accompanies a backward or outward dislocation of both forearm bones at the elbow.

An abduction strain of the forearm, then, just short of that producing an outward dislocation, tears off the internal epicondyle by reason of the attachment of the internal lateral ligament to its base. The inner side of the joint is opened up, the capsule is invaginated and the epicondyle is drawn into the joint; with the strain then ceasing to act, the radius and ulna spring back to their normal position and the epicondyle remains imprisoned within the joint. Such is my conception of the mechanism of displacement of the internal epicondyle into the joint.

The ulnar nerve is at the same time stretched and kinked, hæmorrhage takes place within its sheath and a more or less complete ulnar nerve block is the result.

Lesions of the internal epicondyle may, therefore, be conveniently classified as follows:<sup>(15)</sup>

1. Direct trauma lesions, frequently comminuted and rarely associated with ulnar nerve lesions.
2. Indirect trauma lesions, sprain fracture, usually an epiphysiolysis (a) with slight displacement, no ulnar nerve lesion occurring; (b) with the epicondyle displaced down to the level of the joint line, sometimes an ulnar nerve lesion resulting; (c) with the epicondyle displaced into the joint an ulnar nerve lesion almost invariably resulting from stretching; (d) associated with outward or backward dislocation of radius and ulna at the elbow joint, an ulnar nerve lesion being always associated with outward dislocation.

#### Treatment.

The only group presenting any difficulty in treatment is that in which the epicondyle is displaced into the joint. Mr. Norman Roberts,<sup>(16)</sup> of Liverpool, reported in 1934 four cases in which the fragment was successfully manipulated out of the joint; he did this by extension of the elbow in a supinated position, and then opening out the inner side of the joint by abducting the forearm and then flexing it. Since reporting these cases, he has successfully manipulated others, some of which I saw him do. The wisdom of this procedure has been attacked by Fairbank and Buxton,<sup>(17)</sup> who contend there is danger of further damage to the nerve. If manipulation fails, or I think in all cases, the inner side of the joint should be cut down upon. The fragment is easily slipped back into position, and may be held with one catgut suture. The ulnar nerve is isolated and is usually found to be thickened with interstitial hæmorrhage. The question of transposing the nerve to the front of the joint then arises. Opinions on this differ; Platt always transposes



the nerve and Mr. McMurray does if it is definitely thickened. Personally, I should transpose the nerve at the time of operation.

In one case of mine the epicondyle was replaced by open operation, but although the ulnar nerve was bruised and swollen, it was not touched. Ulnar paralysis disappeared completely in seven months. Further exploration of the nerve had been considered at five months when the ulnar lesion was persisting, but was postponed on account of an attack of diphtheria.

#### Fractures of the Head of the Radius.

Fractures of the head of the radius may be the result of direct violence, but usually result from indirect violence, force being transmitted up the shaft of the radius as a result of a fall on the hand with the forearm pronated and partially flexed. The varieties of this fracture are as follows:

1. A small chip may be chiselled off the outer or anterior aspect of the rim of the head. This chip fracture occurs also in association with backward dislocation of both bones of the forearm.

2. A large fragment, one-third or more of the head, may be split off.

3. The head may be comminuted into several fragments, and in the most severe forms of this type the fragments may be displaced widely into the surrounding tissues.

4. Lastly, the whole head may be separated off at the neck, that is, fracture of the neck of the radius; sometimes the neck may be impacted into the head. In children greenstick fracture of the neck is fairly common, usually with only slight displacement, sometimes marked. Separation of the epiphysis of the head is very rare.

#### Treatment.

With a small chip or a larger crack fracture with no displacement conservative treatment is indicated; the elbow is treated in flexion with the forearm supinated. A small chip which is displaced will interfere with rotation movements and should be removed.

When a larger segment is separated and displaced, or when the head is broken into several pieces, the whole head should be removed. Removal should not be delayed. The joint is exposed through a posterior longitudinal incision, which should not be prolonged down much below the neck of the radius, on account of the posterior interosseous nerve; the bone is divided through the neck, and the division is preferably made with a sharp chisel so as not to leave fragments of bone which may cause ossification later. After operation the elbow is slung at a right angle, and active movements are commenced in fourteen days. The results of excision of the head are very satisfactory. Some limitation of rotation and full extension remains, but the patient has a strong, useful, and painless elbow. In fractures with displacement, if excision is not done, movements of rotation remain painful and arthritis of the joint develops. Excision is contra-indicated in children, as it involves the epiphysis of the upper end of the radius. Greenstick fracture

of the neck in children is treated conservatively with good results.

Fractures of the olecranon occur usually in adults. They are caused either by a fall on the semi-flexed and supinated forearm, the powerful triceps snapping the olecranon over the lower end of the humerus; or they may occur from direct violence, when the olecranon breaks across its narrow middle, and there may be some degree of comminution. With slight separation, that is up to two to three millimetres, good results are obtained by splinting in the position that gives good approximation. This is not always full extension, often a position just short of this is best, and the best splint is an anterior plaster slab moulded to fit and bandaged on. With any more separation than this the ragged torn ends of the triceps expansion become curled down between the fractured surfaces, preventing apposition and bony union.

The correct treatment in these cases is to expose the fracture through a slightly curved posterior incision, and by means of a series of stout twenty-day catgut sutures passed through the triceps expansion above and below in a circular manner to obtain firm apposition.

Or the bone may be drilled and apposition obtained by catgut sutures. Unabsorbable material, such as wire or screws, or even silkworm gut, is objectionable, and that it is unnecessary is shown by the good results obtained in Liverpool, where all suturing is done with catgut. *Fascia lata* strips may be used for suture material, or strips from the fascia covering the triceps may be turned down and passed through a tunnel bored in the shaft of the ulna adjacent to the fracture.<sup>(18)</sup>

After operation the joint is put up in plaster in a position of as much flexion as the sutures will safely stand, for two reasons: (i) There is a tendency when the position of full extension is used for the fragments to buckle forwards so that a ridge is left on the articular surface at the fracture line. (ii) Full flexion is more quickly regained.

The elbow is immobilized for about five weeks, when signs of union will have occurred, and flexion is then gradually regained by voluntary movement. Results are good, even if the union is firm fibrous, but after operation bony union is usually obtained. Fracture of the coronoid process of the ulna requires little mention; this may occur associated with a backward dislocation, or as an isolated injury produced by a hyperextension strain. Replacement by manipulation is usually easy and the elbow is treated in flexion in the usual way for about three weeks.

#### Acknowledgements.

In conclusion, I wish to thank the Branch for doing me the honour of asking me to deliver this paper. I wish also to acknowledge help which I have received from the Liverpool surgeons and for their permission to use reproductions of skiagrams of some of their cases, and also Mr. Harry Platt, of Manchester.



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# HEREDITARY MULTIPLE TELANGIECTASIA, WITH THE RECORD OF AN AFFECTED AUSTRALIAN FAMILY.

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Melbourne.

HEREDITARY multiple telangiectasia is a very rare disease. It has been computed that one hundred families or about six hundred persons are affected. I have recently discovered an Australian family which suffers from it, and as the diagnosis has apparently been overlooked heretofore and the cases have not been reported, so far as I am aware, I think this family is worthy of being recorded.

Osler,<sup>(1)</sup> in 1901, gave the first full description of the condition in an article entitled "On a Family Form of Recurring Epistaxis, Associated with Multiple Telangiectases of the Skin and Mucous Membranes". Hence the condition has been called "Osler's disease". In this article he gives details of three cases and states that he had been able to find only one record in the literature of a similar condition, which had been reported by Rendu in 1896. Since then cases have been recorded from time to time in the literature. Thus Brown Kelly<sup>(2)</sup> reported the condition in two sisters, the elder of whom died after a severe and prolonged epistaxis.

<sup>1</sup> Read at a meeting of the Ear, Nose and Throat Section of the Victorian Branch of the British Medical Association, October, 1936.

Interest in his article centres in the two beautiful illustrations in colour, which show the distribution of the telangiectases on the face and in the mouth.

In the recorded cases, the attacks of nose-bleeding began in childhood and gradually increased in severity. They always preceded the appearance of the telangiectases on the skin. These appear in patients between twenty and twenty-five years of age and gradually increase in size, especially from the age of forty onwards. On the skin they appear mostly on the cheeks and on the hands, especially under the finger nails. They usually appear as tiny spots, like pinpricks, situated at some distance beneath the surface. With their increase in size, they gain in prominence and depth of colour, so that the larger ones form dark purplish elevations, three to four millimetres in diameter.

In the nose, the telangiectasia affects the septum and turbinates, either in the form of bright red tiny dots, short thin lines, or like purplish vesicles. Coughing, sneezing or stooping is enough to start an epistaxis, but often the bleeding commences spontaneously. In the mouth, the parts most affected are the lips and dorsum of the tongue.

As the bleeding tendency increases, the patients suffer from breathlessness, swelling of the feet and other symptoms of profound anemia, a high degree of which seems to predispose to increased bleeding.

Goldstein<sup>(3)</sup> has made many contributions to the literature in this condition. In the *Archives of Dermatology and Syphilology* he contributes a long article in great detail and appends a bibliography of one hundred and eight references. As he considers that the condition may not be solely confined to the skin of the face and the mucosa of the mouth and nose, a quotation from his article is of interest:

Multiple hereditary hemorrhagic telangiectasia, Osler's disease or Goldstein's hereditary angiomatosis, known and recognised for nearly thirty-five years as a definite clinical entity, has been studied carefully and exhaustively by a number of distinguished and well-known medical writers.

This interesting and obscure condition, always annoying, often disabling and disfiguring, sometimes fatal and quite frequently unrecognised and wrongly diagnosed, occurs in families in hereditary fashion, is transmitted by both sexes and affects both male and female.

Sometimes these patients are seen first because of severe persistent and recurrent epistaxis; vaginal or uterine bleeding; hematuria that continues unexplained; hemoptysis not due to rheumatism, tuberculosis, mitral disease, aneurism or purpura; gastric or rectal bleeding not due to ulcers, a malignant condition, hemophilia, leukemia or cirrhosis, sometimes because of severe or moderate anemia and rarely because of many disfiguring "red spots" on the face and body or intra-ocular, cerebral, gastric or meningeal hemorrhage.

Recently, in *The British Medical Journal*, Goldstein,<sup>(4)</sup> recording a family tree of eighteen affected individuals, writes:

Rendu-Osler-Weber's disease—hereditary angiomatosis with recurring hemorrhages—a hereditary hemorrhagic dysplasia, not sex-bound and transmitted by both sexes, with normal cytological and chemical blood-findings (except secondary anemia) and normal clotting and bleeding times, has during the past ten or fifteen years been more frequently diagnosed and reported. Many instances no doubt still go unrecognised and misdiagnosed.

Perhaps many of the peculiar hæmorrhagic states, previously reported as familial epistaxis, pseudo-hæmophilia, familial hæmoptysis, familial hæmaturia, and even as "hæmophilia" or "hæmophilia in females", belong to this interesting clinical entity known under various names.

#### Record of an Australian Family.

Mr. J.L., aged twenty-six years, attended my clinic at the Eye and Ear Hospital on October 18, 1935, complaining of nose-bleeding. He stated that he had suffered from this condition for as long as he could remember, but that it had become much worse during the last three years. Lately he had become slightly breathless on exertion. Two years previously a surgeon in the country had performed an operation on his septum, but the bleeding remained unrelieved. He had a peculiar copper-hued complexion, and in the skin of the cheeks and malar regions were numerous purplish elevations, about two millimetres in diameter. There were also a few red spots in the lips (see Figure I). He stated that the spots had first appeared about six years before.

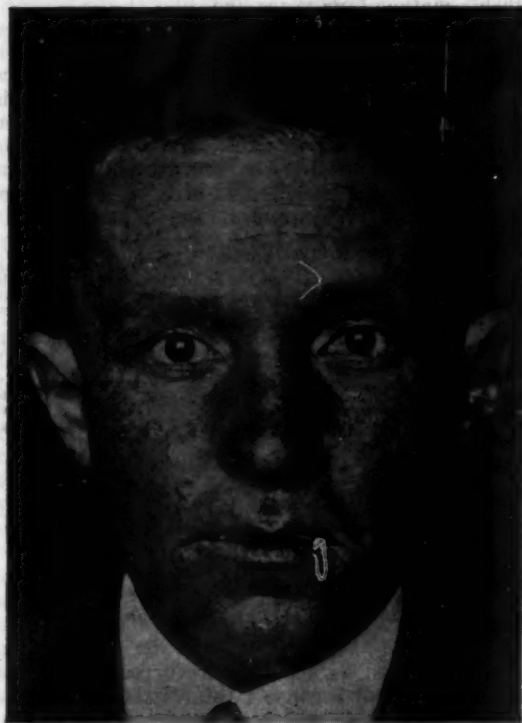


FIGURE I.

The interior of the nose presented a remarkable appearance. Everywhere, on the septum and turbinates, was a meshwork of fine dark-red lines, standing out from the somewhat paler intervening mucosa. The blood picture was normal, as also were the clotting and coagulation times. The hæmoglobin percentage was eighty. It was found that he had an infection of the maxillary antra. This infection cleared up after several wash-outs. No treatment of the telangiectatic condition in the nose was attempted. He was put on a mixture containing iron and ammonium citrate, and he then returned to his home in the country. Recently he wrote to say that he was feeling fairly well. At times his nose bled a lot and then would ease off a bit.

Mrs. G., aged fifty-three years, was an aunt of the above patient. She also gave a history of nose-bleeding for as long as she could remember, and at the age of seventeen

red spots began to appear on her face. For many years the nose-bleeding had been extremely troublesome, never a day passing without the occurrence of several bleedings. For some months she had been unable to take slight exertion without becoming breathless, and at times her ankles became swollen.

She presented a most remarkable appearance. On the cheeks, ears and nose were numerous angiomata, from two to five millimetres in diameter, from the larger of which veins radiated outwards. Their bright crimson colour was in great contrast to the very pale skin of the face. The angiomata were packed closely together on the lobes of the ears (see Figures II and III). Small red



FIGURE II.

spots were present under the nails. On the dorsum of the tongue were several raised angiomatous plaques. The nasal vestibules were somewhat stenosed, which made adequate inspection of the nose rather difficult, but several red spots could be seen on the turbinates. The blood picture showed the characteristics of a secondary anaemia. The clotting and coagulation times were normal and the hæmoglobin percentage was forty.

She was admitted to hospital and treated by complete rest in bed. She was given a mixture of iron and ammonium citrate with Fowler's solution. Liver extract was also given by the mouth and one intramuscular injection of liver extract was given. After the latter there was a rapid rise in the hæmoglobin percentage, which eventually attained eight-eight. Coincident with the improvement in the anaemia the epistaxis became less, and finally ceased completely during her last week in hospital. When she returned home and resumed her household duties the bleeding recommenced to a slight extent. When interviewed recently she said she had been keeping very well since she was discharged from hospital nine months before and that her nose had not bled at all during the past month.

The tree of the affected family is shown in Figure IV.

A was the father of the first generation. He was affected with nose-bleeding and had red spots on his face. He was born in Tasmania and his parents

came from England. It is not known whether they were affected.

$B^1$  had nose-bleeding and very bad spots on the face. These were even more pronounced than in Mrs. G.



FIGURE III.

$B^2$  is Mrs. G. who is recorded in detail above.

$B^3$  has not been examined, as he lives in New South Wales. He writes as follows:

I have been affected with nose-bleeding for most of my life, but not so much of later years. In fact, it has practically ceased to bleed now. In my earlier life it has bled

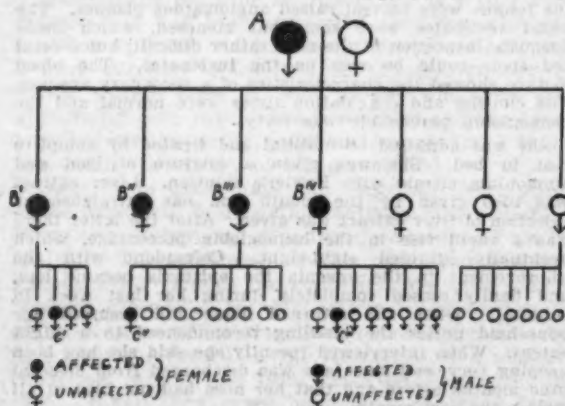


FIGURE IV.

Showing genealogical tree of affected family.

for hours at a time and I have been so weakened through loss of blood that I have been almost unable to stand. I have no red spots on my face. I have not been under a doctor with this complaint.

$B^4$  has not been seen by me either, but she writes from South Australia:

My nose has been bleeding all my life, but not so terribly much till some fourteen or fifteen years ago. I have small spots on my face, finger tips and one on my tongue. About four years ago I visited Adelaide, where I was treated for poverty of the blood. My nose was cauterized by a specialist, since when it has improved somewhat, but it still bleeds a good bit at times and leaves me very weak. My family history was not inquired into, and, so far as I know, I have not been reported in a medical journal.

$C^1$  is Mr. J.L. who is recorded in detail above.

$C^2$  is aged fifteen years and is the eldest child of  $B^3$ . Her nose bleeds to excess at times, but she has no spots on her face.

$C^3$  is the second child of  $B^4$ . He has red spots on his face and his nose bleeds a lot. He was unrelieved by treatment when he visited Adelaide with his mother four years ago.

#### Acknowledgements.

I am indebted to the late Dr. Herman Lawrence for indicating the correct diagnosis of this condition, with which I had previously been unfamiliar, and to Dr. R. C. E. Brodie for supplying me with some references on the subject. For the photographs, I am indebted to Mr. W. H. Preston, of the University Anatomical Department.

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#### RECURRENT ABDOMINAL PAIN IN CHILDHOOD.

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I HAVE chosen as a subject recurrent abdominal pain in childhood because I think it is of universal interest to us all, and because, by reason of its many aspects, its variations may be misinterpreted. For the purposes of this paper I have excluded those cases in which pain is present for the first time, whether due to disease of the intestinal tract itself as in acute appendicitis, or to disease outside this tract as in pneumonia.

When a child has recurrent attacks of pain which it locates in the abdomen, the problem presented for diagnosis is always difficult. The underlying cause may be unimportant, or it may be a vital matter. The pain may simply be due to gas from indigestion or to some serious pathological lesion which may cause death unless it is recognized and efficiently

<sup>1</sup> Read at a meeting of the South-Western Division of the Western Australian Branch of the British Medical Association at Bunbury on October 26, 1936.



treated. Even in children it is not certain that the pain is really in the abdomen or, if it is, in what part of the abdomen it is situated, the testimony of young children being notoriously unreliable. The presumption, of course, is that the cause of the pain is in the gastro-intestinal tract. It may, however, be outside it, and it is wise first to look for causes outside the intestine; if they can be eliminated, then the source of the pain must be in the gastro-intestinal tract.

Let us first consider some of the less common causes of abdominal pain.

#### Tuberculosis of the Spine.

Tuberculosis of the spine will never be missed if the spine is examined and its flexibility is tested. Not only flexion and extension, but also lateral movements, should be investigated in every case. If any doubt exists, radiographic examination makes the diagnosis certain.

#### Pelvic Disease.

Very rarely does pelvic disease cause abdominal pain, although I have on two occasions seen acute lower abdominal pain, probably due to salpingitis, in young girls with vaginitis, who were undergoing frequent and too energetic treatment; one patient was aged four years and the other nine. However, the possibility should be borne in mind.

#### Lead Poisoning.

Although lead poisoning from paint licking in infancy is very rare in this State, in other parts of the Commonwealth it is not infrequent. However, abdominal pain associated with lead poisoning in children is a most unusual symptom. Nevertheless, it should be considered in recurrent abdominal pain, particularly if associated with anemia and gingivitis. A lead line on the gums is most inconstant in childhood; stippling of red cells is also not universal. Urinary estimation of lead and X ray examination of the long bones are the surest methods of diagnosis. I have seen mild lead poisoning in a three weeks old child whose mother also suffered from it.

#### Urinary Tract Disease.

Renal colic due to calculi is very uncommon, although colic due to passage of oxalate crystals is not uncommon in younger children.

**Pyelitis.**—Pain is not an uncommon symptom of pyelitis in older children, although it is seldom predominant; naturally urinary examination will disclose the diagnosis. It is perhaps unnecessary to remark on the necessity for urinary examination in every case. At the same time it may not be out of place to remind you that a chronic or recurrent low grade pyelitis, or more correctly pyelonephritis, is one of the most frequent causes of vague ill-health encountered in girls of three to five years.

#### Gall-Bladder and Bile Duct Disease.

I have on several occasions found chronic cholecystitis the cause of abdominal pain in pre-

adolescents. It is usually accompanied by dyspeptic symptoms, which are not infrequently attributed by the examiner to the appendix. The usual dye tests are quite satisfactorily borne and seal the diagnosis. In my small series of five the youngest patient was seven years of age, and I have operated on an acute gall-bladder condition in a patient of eight years, the pre-operative diagnosis being acute appendicitis.

#### Epigastric Hernia.

Epigastric hernia is usually mentioned as a cause of persistent or recurring abdominal pain. I have never been able to satisfy myself that such a hernia was responsible for symptoms. Incidentally, I have never seen pain or discomfort from an umbilical hernia in young children.

#### Thread Worm.

Thread worms are frequently found in patients operated on for recurrent appendicitis. The pain is usually of the nature of appendicular colic, but, apart from this, I do not think thread worms cause abdominal discomfort. Naturally they are frequently the cause of restlessness, of itching of the anus and of priapism; and also they should be looked for in enuresis and vaginitis.

The single, long, round worm, "Singapore worm", has, in my experience, been responsible for umbilical colic, and I would stress the importance of searching for it in children coming from Malaya, India or Ceylon. In such children only has it in my experience been found here.

#### Abdominal Adenitis.

Two less common causes of abdominal pain are abdominal adenitis and tuberculous peritonitis. The former, abdominal adenitis, may involve the mesenteric glands in the ileo-caecal junction and careful palpation after emptying of the bowel will frequently disclose them. Occasionally it is helpful to palpate the abdomen with the child in the "all fours" position. Such an adenitis very often follows closely upon an intestinal upset; indeed, I have seen three cases in infants in which after enteritis the glands broke down and caused a suppurative peritonitis.

Another type of abdominal adenitis which I have never seen described in the text-books is that involving the deep iliac group—beneath the iliac fascia—from infected foci in the leg, buttock or back. This type of condition is usually referred for treatment as an appendicular abscess. In one instance I have seen such a suppurative process rupture through the iliac fascia into the peritoneal cavity and lead to fatal peritonitis. The situation, leg flexion and general good condition of the child usually give the clue.

#### Tuberculous Peritonitis.

Most cases of tuberculous peritonitis occur in children under three years of age, and, as a rule, pain is not a prominent feature. The general symptoms of anorexia, malaise, loss of weight are present, but as a rule are indefinite. Careful palpa-

tion of the abdomen and bearing in mind the possibility are all that is necessary. Confusion is apt to arise in connexion with the massive glandular type that frequently presents a stony hard mass in the ileo-caecal region. The plastic and ascitic types do not as a rule cause much difficulty in diagnosis. Remember that tuberculous processes in childhood may remain latent and may manifest themselves only after a debilitating illness, particularly measles or enteritis.

#### Abdominal Symptoms in the Erythematous Group of Skin Lesions.

The intestinal symptoms associated with Henoch's purpura and Schönlein's disease are worth bearing in mind, as occasionally the intestinal colic may precede the appearance of the purpuric rash or nodular erythema. Remember also that melena may accompany the skin purpura and colic.

Gastro-intestinal allergy may manifest itself by abdominal soreness, recurrent diarrhoea, vomiting or constipation. Naturally there will often be a history of allergy or allergic manifestations elsewhere. Examination frequently discloses a tender spastic colon, quite palpable. In the absence of more definite allergic manifestations, due attention must be paid to food likes and dislikes or upsets, repeatedly following the ingestion of certain food-stuffs.

#### Peptic Ulcer.

Peptic ulcer is most uncommon in children, although in the few cases reported the symptomatology has been similar to that of peptic ulcer occurring in adults. Excluding the new-born, the two cases I have seen manifested themselves by hæmorrhage. Nevertheless, the possibility is worth bearing in mind, coupled with that of a pathological gall-bladder.

In this regard I should like to mention the profuse melena which may result from a Meckel's diverticulum. This diverticulum almost invariably contains a small amount of mucous membrane resembling gastric mucosa and containing oxyntic cells, and it is from this area that profuse hæmorrhage may occur.

I have seen two such cases, one in a youth of fifteen years, and the other in a girl, aged six, who had had intermittent melena from the age of one and a half years onwards. The first case was verified at autopsy and the second patient made a dramatic recovery after operation following X ray confirmation of the diagnosis.

Recently I saw a third case that was similar in its symptomatology, and in which the X ray findings were equivocal. Exploratory operation disclosed not a Meckel's diverticulum, but a blind appendix, or perhaps more correctly an appendicular diverticulum, which, on section, strongly suggested similar appearances to those already mentioned. Removal once again led to a dramatic cure.

These cases, though admittedly rarities, are worthy of thought, as they may occur to any of us in practice.

#### Chronic and Recurrent Appendicitis.

With the manifestations of chronic and recurrent appendicitis you are all familiar, and naturally it

has to be excluded in the presence of any recurrent abdominal pain in childhood. Most often such cases do not present the classical picture, but I would direct your attention to its frequency as a cause of dyspeptic symptoms in the ten-year-old period. You are all familiar with the story of a child who is easily upset and who, in consequence of anorexia, gas pains and vague abdominal discomfort, is compelled to miss odd days at school. The child's parents are worried because she is out of sorts, irritable and pale. Frequently you will elicit deep tenderness over the appendix or some muscle spasm in the flank or loin. In my experience the dyspeptic type of appendix in this age group is most frequently retrocaecal and the gland at the ileo-caecal junction is found enlarged at operation.

Another sign on which I place reliance is the presence of a persistent "squelchy" caecum, despite definite bowel clearance. This is often accompanied by a spastic condition of the colon which is detectable if carefully sought.

#### Cyclic Vomiting.

While it often occurs as a manifestation of the acidotic syndrome, cyclic vomiting is, in my opinion, frequently associated with a chronic infection of the appendix. I will grant you that many of these children require in addition some dietetic adjustment, but that alone in the majority of cases does not effect a cure.

I have mentioned once or twice spasm of the colon. This may be detected fairly frequently on examination of the sufferer from intestinal dyspepsia. The child is usually of the nervous type, and is frequently the victim of food fads—high carbohydrate food feeding and excess roughage. Sometimes the spasm is mainly confined to the anal sphincter, but more often the spastic colon, the descending colon particularly, may be distinctly felt. The provision of a fine sieved diet, free from roughage and fruit and vegetable fibre, and the administration of a simple carbonate of magnesia, rhubarb and senna mixture with belladonna is usually sufficient to relieve the condition. In this regard may I suggest that patients affected in this way often present an allergic history, and although the condition does not come within the scope of this paper, may I be permitted to offer my opinion that pyloric stenosis frequently occurs in the offspring of parents who are definitely allergic.

#### Congenital Malformation of the Intestine.

Most of the serious malformations of the intestine cause death in infancy. Those consistent with life are usually located in or about the duodenum or colon. They are most likely to be associated with constipation due to interference with the passage of intestinal contents, and pain usually results from the associated increased peristalsis.

The most commonly met abnormality is Meckel's diverticulum, and its presence is most likely to manifest itself by obstruction or hæmorrhage. Other abnormalities will be diagnosed at operation or by X ray examination.



**Redundant Colon.**

Redundant colon is fairly common and may cause pain and distension from accumulation of gas. The true megacolon does not usually cause pain, but the redundant colon is in my experience found most often in those children who are anæmic, who assume a faulty posture, and who present atonic abdominal musculature. The treatment is rest, controlled exercises and occasionally abdominal support. In fact, after all abdominal operations I insist on the patient's practising controlled exercises—breathing, bending and swinging—and would earnestly recommend the system to you.

**Injuries to the Abdomen.**

Although injuries to the abdomen are not common, they may result in pain from hæmorrhagic effusion into the bowel wall or mesentery causing adhesions.

An instance of this was forcibly brought to my notice two weeks ago, when, on account of a diagnosis of ruptured spleen, I opened the abdomen of a boy who had been run over. Certainly his spleen was completely disrupted and he had some kidney laceration, but in addition he had a huge hæmatoma of the root of his mesentery, and extravasation of blood into his bowel. So far he has made a satisfactory recovery, but his subsequent progress will be watched with interest.

**Psychic Causes.**

Turning to psychic causes, my only comment on this doubtful type is to beware of it. I doubt whether undue parental solicitude will produce abdominal pain as a response from the child. I think that in every instance some pathological cause will be found. One occasionally finds, however, in schools, particularly in girls' boarding schools, that if one or two have operations for appendicitis several others will often present vague symptoms of the same condition. Do not be too ready to class these as child mimicry; watch them closely and play for safety.

**Constipation.**

Constipation is quite frequently put forward as a cause of abdominal pain, more often I think than it should be. It is my opinion that in normal children moderate constipation does little or no harm or causes little discomfort save in the passage of hard fæcal masses. The gross constipation of Hirschsprung's disease, associated with no abdominal discomfort, is to my mind the most illustrious example of the trifling damage or discomfort occurring as a result of constipation. I would prefer to blame the routine uncontrolled use of purgatives for the production of discomfort and the interference with the bowel harmony. After all, as far as I know, there is no parliamentary enactment compelling us to use our bowels at specified times and I prefer to practise the wait and see policy.

Much of what I have said is ancient history to you, with much of it you will not agree, but it is all culled from my own experience, and I have attempted to depart from the slavish dictum of the text-book.

**PELVIC INJURIES DUE TO CHILDBIRTH: PROPHYLACTIC TREATMENT AND SOME SURGICAL POINTS IN THEIR REPAIR.<sup>1</sup>**

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No practitioner of gynaecological surgery can fail to recognize the large part played by obstetrical injuries and their sequelæ in producing invalidism and loss of efficiency amongst the patients with whom he has to deal. The importance of childbirth in this respect is brought out when the patients come to seek advice and relate the common story that they have never been the same since one or other of their confinements.

To open a discussion on this important question, I shall attempt tonight to point out some of the reasons why gross injuries occur during the act of parturition, and to indicate the general principles of their prophylaxis and surgical treatment.

**Some Anatomical Points of Importance.**

The pelvic cavity is closed in below by a sheet of muscle covered by a dense layer of pelvic fascia. This forms a concave floor. The central fibres of this muscular sheet run from the pubes to the coccyx forming the pubo-coccygeus muscle. Between this muscle and the *obturator internus* laterally are the transverse and oblique fibres of the coccygeus and the ilio-coccygeus muscles, some of the fibres of which intersect those of the pubo-coccygeus.

The fibres immediately surrounding the rectum are commonly distinguished by the name *levator ani* muscle, the right and left halves being called collectively the *levator ani*. This muscular diaphragm is pierced in the middle by the urethra, the vagina and the rectum from before backwards. Where these tubes perforate the diaphragm they acquire support and strength from muscle fibres of the pubo-coccygeus, which are incorporated and carried downwards in their walls to varying depths. This accession of strength takes place in the middle portions of the three tubes, and, at least as far as the urethra is concerned, has an important sphincter action.

The pelvic diaphragm, looked at from above, is more or less of a funnel. Between it and the upper portions of the perforating tubes, the space is filled by a fibro-muscular structure, the parametrium, condensed in certain directions to form supporting ligaments.

The parametrium forms a thick band of fibro-muscular tissue at the base of the broad ligaments; it connects the cervix and upper portion of the vaginal walls with the lateral pelvic muscles and fascia. This specialized band is sometimes called the transverse cervical ligament. Other names have been applied to it such as Mackenrodt's ligaments, and the cardinal ligaments of the cervix.

The parametrium is also continued forward at the base of the utero-vesical ligament and the bladder

<sup>1</sup> Read at a meeting of the Central Southern Medical Association, New South Wales, on April 9, 1937.



to gain attachment to the back of the pubes. In the opposite direction it is continued backwards at the base of the utero-sacral ligaments to be inserted into the sacrum. Owing to these specialized reinforcements the parametrium, together with the muscular pelvic diaphragm, is the most important structure in securing the uterus in position. To put it in another way, the cervix and upper portion of the vagina are maintained in position by two lateral fan-shaped expansions of fibro-muscular tissue. These expansions extend on each side along the whole length of the lateral vaginal walls above the muscular pelvic diaphragm, and include also the supravaginal cervix. They are inserted into the fascia covering the side walls of the pelvis along the lines of attachment of the muscular diaphragm.<sup>(1)</sup> A further extension of the parametrium passes downwards between the posterior vaginal wall and the rectum to form the recto-vaginal septum.

It is important to remember that the parametrium contains a large proportion of non-striped muscular tissue, which supplies the necessary quality of elasticity to this supporting structure, and which allows for the varying sizes of the pelvic viscera according to their distension.

Finally, the closure of the vulval orifice depends upon the integrity of the perineal body together with the superficial perineal muscles.

#### Pelvic Injuries During Labour.

In only a very small proportion of first labours does the cervix escape at least some degree of laceration. If dilatation is complete and taking up of the cervix has occurred naturally, as a rule only the superficial tissues about the external os are involved and healing takes place in most cases without leaving serious disability. It sometimes happens, however, even when labour has been entirely spontaneous, that a deep laceration may be found subsequently. This is probably more likely to occur when labour is dry and prolonged than when the normal bag of forewaters remains intact until the end of the first stage, even though labour may be precipitate. In the former type of labour the cervix tends to become oedematous and friable, and tears easily before dilatation is complete.<sup>(2)</sup>

An extreme case of this nature which I saw in consultation last year was that of a *primipara* in which spontaneous amputation of the oedematous anterior cervical lip took place.

The patient was a well-developed young woman, twenty-six years of age. She came into labour at term on September 9, 1936. I was called in to see her on the evening of September 13, 1936, after her medical attendant had discovered, when making a vaginal examination, that the oedematous anterior lip had separated for one and a half inches transversely. The character of the labour had not been unusual, the membranes having ruptured twenty-four hours before I saw her. An examination of the abdomen showed that the fetus was presenting by the vertex in the left occipito-anterior position. The fetus seemed large and the fetal heart sounds could be heard faintly in the left iliac fossa. They were 160 per minute, the rhythm was irregular. A vaginal examination showed the head to have entered the pelvic cavity, but there was a transverse laceration of the oedematous anterior lip which

could be seen presenting at the vaginal orifice as a plum-coloured mass. Delivery was completed by forceps traction, but before the head was born the sausage-shaped anterior lip became separated at each side, and slipped out of the vagina. The tissue was a strip four inches long by one inch in thickness, oedematous and necrotic; it separated with only a moderate amount of traction on the head. The delivery of a stillborn infant of eight pounds three and a half ounces was carried out without much difficulty. The puerperium was prolonged, but after three weeks the cervix had healed minus one inch by half an inch of its anterior lip.

It is far commoner, however, for deep laceration involving even the lateral vaginal fornix to occur where there is any interference with the natural process of dilatation. Serious laceration and subsequent disability will inevitably follow manual dilatation no matter how slowly and gently it is done, the application of forceps before dilatation is complete even when the greatest care is taken to slip the cervix over the advancing head, or attempts at breech extraction before full dilatation has occurred.

Lacerations of this character heal very slowly with the formation of a great deal of scar tissue. They usually become the site of chronic infection and "erosion" about the margins of the laceration, the outward sign of which is a muco-purulent discharge. Later there is a loss of elasticity in the parametrium, probably caused by chronic lymphangitis and parametritis in the vicinity of the injury. On account of this toughening of the parametrium and the formation of scar tissue, prolapse of the uterus does not occur in such cases.

When forceps are applied before dilatation is complete, or when a breech delivery is forced too soon, there is often an associated trauma that is more deeply seated. If the cervix is soft and splits when traction is made on the presenting part, the strain on the transverse cervical ligaments may be relieved, and subsequent prolapse may be avoided. When, on the other hand, the cervix is pulled down close to the vaginal orifice, the strain on these ligaments is too great for them. They are either so overstretched that they never afterwards regain their tone, or they are torn away from their attachments. In these circumstances subsequent prolapse of the uterus must follow, often making itself evident soon after the puerperium is over.

Another cause of damage to the transverse cervical ligaments is the force applied after a high forceps application, even when full dilatation of the cervix is present. In these circumstances it is inevitable that strong traction must be used to bring down the head, and while this is being done the vaginal walls will be drawn down in advance of the head. Those fibres of the transverse cervical ligaments that are attached to the vaginal wall in its upper third will suffer injury in consequence from overstretching or rupture. This type of injury is commonly associated with damage to the supports of the bladder; these supports subsequently become inefficient, and this leads to stress incontinence of urine accompanied by varying degrees of cystocele and descent of the uterine body.

Overstretching of the anterior vaginal wall and of the supports of the bladder sometimes occurs

when the head is allowed to remain too long on the perineum. It is a very different thing to advocate the application of forceps when the head is at the brim or in the cavity of the pelvis than it is to advise their use when the vertex is showing at the vulva. In the latter case when delay occurs the timely use of instruments together with the aid of anaesthesia will give complete control of the birth of the head, and will avoid the risk of permanent damage to the supports of the anterior vaginal wall and bladder.

#### Injuries Involving the Pelvic Floor.

The pelvic diaphragm and the perineum may be damaged by a single difficult labour, or as a result of a series of births, each one contributing a little more injury. Here we have a varying degree of overstretching or laceration of the pelvic diaphragm often involving laceration of the perineal body. It is well to remember that separation of the two halves of the pelvic diaphragm and injury to the recto-vaginal septum may take place without an actual tear of the mucous membrane.

If the immediate repair of perineal laceration is not done effectually, or if healing is not satisfactory, it is inevitable that prolapse in one form or another of the pelvic contents will eventually follow. This is due mainly to the loss of support from below, added to which there is the alteration in the shape of the vagina. Instead of a canal capacious above with a narrow outlet below it becomes cylindrical in form or even wider below than where it surrounds the cervix. Another anatomical change which occurs after widening of the vaginal orifice has taken place is an alteration in the axis of the vagina. The axis becomes vertical, as distinct from the normal obliquity from above downwards and forwards.

When an increase of abdominal pressure takes place during effort, instead of the pelvic diaphragm being able to close this valve-like slit of the vagina, the very opposite happens. During an access of intraabdominal pressure such as occurs in coughing or straining at stool, the two halves of the muscle automatically contract. Instead of strengthening the resistance of the pelvic floor, the two separated portions of the muscle when they contract pull further apart and actually increase the gap between them. This failure in the normal closure of the pelvic outlet allows a hernial process to begin. Prolapse of the anterior vaginal wall is generally the first step in the development of the hernia resulting in the formation of a cystocele. Provided the upper and middle supports of the uterus have not suffered injury, the cystocele may remain for many years the only sign of disability. It is only a matter of time, however, when the constant downward traction of the vaginal walls upon the cervix will bring about first its elongation and then stretching of the uterine supports; in the end the uterus will become prolapsed. This late development is commonly met with soon after the menopause when atrophy of the supporting tissues follows the cessation of sexual activity.

In those cases in which the recto-vaginal septum has been torn, if the immediate repair of the perineal laceration is not effective, the lower part of the anterior rectal wall will protrude through the split in the septum to become adherent to the scar in the posterior vaginal wall. Owing to the forward angulation of the bowel at this point the posterior vaginal wall will in time prolapse, leading to the formation of a rectocele.

A third degree tear in which the bowel is involved is often the result of breech delivery in a *primipara* or of forceps extraction of the vertex in the occipito-posterior position. If the repair by suture of such a laceration does not heal satisfactorily, control of the bowel becomes more or less weakened. In many cases the tear is comparatively superficial, involving mainly the perineal body, the *levator ani* escaping with only slight injury. For this reason, besides the fact that there is less straining at stool, uterine prolapse rarely follows.

Retroversion of the uterus after pregnancy may be a recurrence of a former displacement, and in this case may not be strictly a puerperal injury. It may, however, follow subinvolution due to mild uterine infection, associated with laceration of the cervix. In a developing prolapse retroversion also commonly occurs as part of the mechanism in descent of the uterus.

#### Prophylactic Treatment.

Prevention of the injuries that have been described is not always possible. The minor degrees of disproportion and ineffective uterine contractions are common causes of delayed labour and are mainly responsible for interference by the obstetrician with the normal process. This interference is unavoidable in many cases, but to it is due a great deal of the injury following childbirth. There are certain basic principles, however, which, although they may appear to you elementary, are essential to good midwifery and to the avoidance of consequent invalidism. They are:

1. The practice of abdominal palpation in the last weeks of pregnancy, which will enable disproportion to be recognized in time for correct treatment to be instituted to lessen difficulty in labour.
2. The avoidance of the application of forceps until the head is low in the pelvis in order to allow "taking up" of the cervix and dilatation of the upper part of the vagina to be complete. On the other hand, instrumental delivery is indicated when the head is held up on the perineum. Undue conservatism in this respect will lead to overstretching and damage to the supports of the bladder.
3. Correct diagnosis of the position of the head by both abdominal palpation and vaginal examination before the application of forceps and then slow delivery by intermittent traction.
4. Regular emptying of the bladder during labour and always before the application of forceps.

As a preventive measure to serious perineal laceration episiotomy has to be considered, as for instance, in breech presentation in a *primipara* or in the delivery of a head, face to pubes. A clean



incision is easier to repair than an irregular laceration probably opening into the bowel.

It is often wise to postpone immediate suture of a serious laceration for some hours until conditions for its repair can be arranged in the most favourable circumstances. A good result is far more likely to be obtained if the operation is put off for a few hours until adequate assistance and daylight are available with the added benefit of securing a comparatively bloodless field of operation than if an attempt is made to carry out the work single handed in the small hours, with poor light and no anaesthetist.

Skill and good judgement in the conduct of labour, combined with careful management of the lying-in period, will do much to lessen the injuries likely to follow difficult labour. In some cases prolapse will develop in spite of the greatest care that can be exercised to conserve the uterine supports and to protect the pelvic diaphragm, but during the puerperium an effort should always be made to stimulate involution of the muscular tissue in the parametrium. Long, hot vaginal douches will assist in promoting restoration of tone in the overstretched muscle fibres. I have found medical diathermy to be invaluable in such cases. It is a treatment that is somewhat time-consuming for the practitioner, but the good results obtained compensate for the time spent. A bipolar current is used with a suitable vaginal electrode. The temperature in the pelvis is raised to between 43.3° and 44.4° C. (110° and 112° F.) for twenty minutes. Usually six applications are necessary. It is not long before one finds that the uterus has contracted spontaneously to its normal size and has assumed its anterior position. The use of diathermy is of most value in correcting retroversion due to subinvolution, but it is remarkable also how a low-grade infection will clear up under the influence of the high frequency current.

#### Surgical Points.

I shall turn now to the discussion of some surgical points of importance in the treatment of pelvic injuries due to childbirth. Reference has already been made to the policy of delay in repairing a laceration until reasonably good operative conditions can be obtained. The suturing itself must be done with a clear idea of the different anatomical layers in the pelvic floor.

It is the teaching of some schools that deep sutures should be introduced from the skin surface of the perineum and tied across outside the vagina. This method has the effect of bunching a mass of tissue in the position of the perineal body, and leads to the formation later of a mass of inert scar tissue in this position. It entirely fails to restore the integrity of the pelvic floor and the two halves of the *levator ani* muscle remain as widely separated as ever.

To effect a good restoration of function in the pelvic diaphragm it is necessary to bring the two halves of the *levator ani* together again. This is accomplished by introducing deep sutures through the vaginal mucosa at the edge of the laceration,

including each half of the levator muscle, and bringing out the suture through the mucosa on the other side. These sutures are tied from above downwards over the mucous membrane of the vagina. When the recto-vaginal septum has been torn through, of course, a continuous suture of plain catgut should be inserted first of all in the depths of the laceration. The external skin of the perineum can be drawn together with interrupted horsehair stitches. I rely on the deep vaginal sutures to unite the mucous edges with sufficient accuracy by inserting them half an inch apart. This allows for the escape of any exudate from the wound. A point to remember is that if these deep sutures are tied too tightly, pressure necrosis of the included tissue is liable to follow, especially as there is a tendency for perineal tissues to swell after laceration, owing in part to mild contamination of the raw surfaces.

If a perineum sutured in this way becomes the site of acute infection, all the sutures should be removed without delay, and the wound left open to heal by granulation. If free drainage of the infected wound is not provided promptly by removal of sutures, the danger of a cellulitis spreading within the pelvis is a grave and often a fatal one.

The surgical treatment of the late sequelae of puerperal injury calls for a considerable amount of judgement and experience. Prolapse varies a great deal in detail until the final stage of complete procidentia is reached.

It is only by a clear understanding of the anatomy of the pelvic floor and the uterine and vaginal supports that one can expect to obtain good results in the plastic surgery of the pelvis.

For practical purposes, the uterine supports can be separated into three groups, increasing in strength from above downwards. The upper supports consist of the two round ligaments. These two structures merely act as loose guy ropes on each side of the fundus to allow the uterus a certain range of movement backwards or forwards, according to the degree of fullness of the bladder or pelvic colon. They were never designed to perform any weight-bearing function, and, for this reason, Gilliam's operation and its modifications often fail, because the round ligaments are made more or less to suspend the uterine body from the anterior abdominal wall.

The second group of supports consists of those specialized bands in the parametrium to which I have already referred, and of which the transverse cervical ligament is of the greatest surgical importance. If it is damaged, the cervix falls forwards and downwards, in all probability causing the fundus to tip backwards. The alteration of direction of intraabdominal pressure will cause retroversion which the round ligaments are unable to prevent.

The third group of supports are by far the strongest of the three. This group is made up of the pubococcygeus muscle, and its covering of dense pelvic fascia, together with the perineal body, form-



ing the pelvic diaphragm. Weakness or injury to this structure is the one common factor in genital prolapse. It is rare to find laxity in only one of these groups of supports, though one may be most affected, owing to the fact that the muscle or the parametrium in that part has received the greatest damage.

The conditions calling for surgical repair are cystocele, rectocele, prolapse of the uterus and stress incontinence of urine. One condition is usually present in excess of the other, but usually all four are present. In view of the varying conditions met with, it is necessary to modify the operative procedure to suit each case. In one a wider amount of tissue is removed from the anterior fornix; in another more care is needed in suturing the muscles over the urethra; in another a wider area of parametrium at the base of the broad ligament may require suturing; in another a wider area is removed from the posterior wall; in still another greater care is necessary in suturing the parametrium below the utero-sacral ligaments to ensure closure of the hernia in the pouch of Douglas.<sup>(3)</sup>

To describe in detail the technique of such operative procedures is outside the scope of this paper. Let me emphasize, however, that the object of all plastic work must be to restore the three groups of uterine supports as nearly as possible to their original condition with the least amount of scar tissue formation.

To quote a remark of T. G. Stevens, of Saint Mary's Hospital, London, when he was visiting Sydney recently: "Plastic operations in the pelvis afford unlimited scope for surgical artistry."

#### References.

- <sup>(1)</sup> Victor Bonney: "The Principles that Should Underlie all Operations for Prolapse", *The Journal of Obstetrics and Gynecology of the British Empire*, Volume XLI, 1934, number 5, page 672.  
<sup>(2)</sup> Douglas Miller: "Common Obstetrical Injuries and their Sequels", *The British Medical Journal*, July 4, 1936, page 4.  
<sup>(3)</sup> W. Fletcher Shaw: "The Treatment of Genital Prolapse", *The Journal of Obstetrics and Gynecology of the British Empire*, Volume XLI, number 6, December, 1934, page 857.

### THE CAUSES OF BLINDNESS IN QUEENSLAND.<sup>1</sup>

By E. O. MARKS,  
Brisbane.

OWING to a high proportion of blindness due to *ophthalmia neonatorum* (five out of eighteen children) in the School for the Blind, Brisbane, a committee was formed with the authority of the Honorable the Minister for Education (the Honorable F. A. Cooper) to inquire into the incidence of and suggest ways of minimizing this cause of blindness.

Essentially with the object of ascertaining the numbers of blind from this disease, information which was a necessary preliminary for any action by the committee, an examination was made of

seventy-eight blind workers at the Blind Industrial Institution in Brisbane. Through the courtesy of Mr. T. A. Maguire, the Deputy Commissioner of Pensions, a search also was made through the papers of all those in Queensland in receipt of pensions for blindness to ascertain the causes of the blindness.

Though the information sought was in regard to *ophthalmia neonatorum*, the other causes were noted and tabulated so far as the information permitted. The figures will be of considerable interest and value in considering any means for reducing the incidence of blindness. It is unfortunate that in any such compilation the figures arrived at have an appearance of mathematical accuracy, usually quite unjustified by the nature of the information on which they are based. Mathematical accuracy certainly does not apply to the figures submitted herewith, though they probably give a very good general idea of the proportionate causes of blindness in Queensland.

Not the least important factor influencing the reliability of such figures is the method of "sampling". The only perfectly reliable statistics—the only really "true sample"—would be a record of an accurate medical diagnosis and history of every blind person in the State. Actually the available information herewith is only of three "samples": 18 children, 78 blind workers, few of whom would have been over forty years old at onset of blindness, and who include very few women, and 192 pensioners of all ages over sixteen (Tables I, II and III).

In regard to the first sample, the children, the history is often very unsatisfactory, though the present clinical condition is satisfactorily observed.

TABLE I.

Analysis of Twenty-three Present and Recent Pupils at the School for the Blind.

Cause.	Male.	Female.	Total.
Optic atrophy .. .. .	2	7	9
Congenital defect .. .. .	4	1	5
<i>Ophthalmia neonatorum</i> .. .. .	1	4	5
Doubtful <i>ophthalmia neonatorum</i> .. .. .	1	1	2
Injury .. .. .	2	0	2
Total .. .. .	10	13	23

TABLE II.

Analysis of Examination of Seventy-eight Blind Workers at the Blind Industrial Institution, Brisbane.

Cause.	Male.	Female.	Total.
Optic atrophy .. .. .	25	4	29
Congenital defects .. .. .	13	5	18
Trachoma .. .. .	7	0	7
Accident .. .. .	6	0	6
Cornual ulceration .. .. .	3	0	3
Eyes enucleated for reason unknown .. .. .	3	0	3
Chorioiditis .. .. .	2	1	3
Retinitis pigmentosa .. .. .	2	0	2
Cataract .. .. .	2	0	2
<i>Ophthalmia neonatorum</i> .. .. .	1	1	2
Detachment of retina .. .. .	1	0	1
Iritis .. .. .	0	1	1
Interstitial keratitis .. .. .	1	0	1
Total .. .. .	66	12	78

<sup>1</sup>Read at a conference of Blind Institutions, Hobart, February, 1937.

TABLE III.  
Analysis of Medical Certification of Blind Pensioners.<sup>1</sup>

Cause.	Male.	Female.	Total.	Approximate Proportion to 100.
Optic atrophy .. ..	17	13	30 <sup>2</sup>	15
Injury .. ..	25	4	29	15
Cataract, congenital and acquired .. ..	15	13	28	14
Trachoma .. ..	11	14	25	13
Congenital defects .. ..	14	6	20	10
Glaucoma .. ..	7	2	9	4
Corneal ulceration .. ..	5	4	9	4
Myopia .. ..	4	2	6	3
Iritis .. ..	4	1	5	2
Keratitis .. ..	3	2	5	2
Choroiditis .. ..	3	1	4	2
Retinal detachment .. ..	3	0	3	1
Retinitis pigmentosa .. ..	2	1	3	1
Hemorrhage .. ..	1	2	3	1
Intracranial pressure .. ..	2	1	3	1
Ophthalmia neonatorum .. ..	1	1	2	1
Tumor .. ..	1	1	2	1
Eclampsia .. ..	1	1	2	1
Arteriosclerosis .. ..	1	1	2	1
Pituitary .. ..	1	1	2	1
Leprosy .. ..	1	1	2	1
Total .. ..			192	

<sup>1</sup> Total papers examined: Male, 185; female, 91; total, 276. Papers with diagnosis: male, 124; female, 68; total, 192.

<sup>2</sup> Of the thirty diagnosed as suffering from optic atrophy, four males and one female were stated to be suffering from blindness due to lead poisoning. Of the thirty, the age of onset was given in twenty-one, and of these twenty-one persons, fourteen were under eight years of age when they became blind.

In regard to the second sample, the blind workers, the examination was made in a well lit room and without dilating the pupils with mydriatic. The condition was good for observing the external ocular diseases, such as trachoma or the scarring that might result from ophthalmia, but was not satisfactory for observing the intraocular causes of blindness. Some of those persons shown as suffering from optic atrophy may have other associated retinal or vascular disease. The history of those blind from childhood was necessarily hearsay from what their parents had told them, and was consequently unreliable.

In regard to the third sample, 192 pensioners, whose papers or medical certificates had information as to the cause of the blindness, there were a further 84 whose files did not yield any information on this point. When it is realized that the certification of blindness was the essential requirement, and that the medical examination must frequently have been made in difficult circumstances by medical men not specially trained in eye work, but who mostly could readily recognize the more obvious external eye diseases, it will be understood that the 192 conditions diagnosed out of 276, though a large sample, is not necessarily a truly representative one. The 84 conditions without diagnosis probably would include a larger proportion of intra-ocular diseases.

In tabulating the diseases it is not possible to be quite definite. Congenital defects should, for instance, include congenital cataract, but many of these latter have probably been put in with the cataract figure. Similarly cataract may be the cause or the result of glaucoma, and it is not unlikely that some of those in one heading should

have been in the other. Corneal scarring from infancy is not necessarily, though very probably, due to *ophthalmia neonatorum*. Again, while keratitis would usually be taken to mean interstitial keratitis, which is a manifestation of syphilis, some of the certifiers may have included ulcerative conditions or trachomatous pannus; and so on through the list.

The blindness of a large number of those included under the heading "Optic Atrophy" would no doubt be due to syphilis, but there are many other causes of atrophy. I do not think that any oculist who has been familiar with the cases of acute ocular plumbism occurring in small children in Queensland would have any doubt that the early atrophy cases (14 out of 21 pensioners whose age at the onset of blindness is stated) were due mostly to lead poisoning. That we do not now often see these cases in Brisbane redounds to the credit of Dr. J. Lockhart Gibson, both for his diagnostic acumen and vigorous propaganda, and to the authorities responsible for the restrictions on the use of lead paint in situations accessible to children.

Some commentary on the figures set out in the three accompanying tables is perhaps fitting.

The most striking item is the proportion of two males to one female amongst the pensioners, and there are probably very few blind in the State who are not in receipt of a pension for blindness. With the surprising exception of trachoma, males exceed females in all the important headings. I should have expected in blindness from trachoma that the males would have greatly exceeded the females owing to their less careful nature as children and to their work as adults. Accidents are, of course, almost a perquisite of the male.

Amongst the optic atrophy cases one might have expected a larger preponderance of the males than is shown; and might have expected that the congenital defects, glaucoma and myopia, would be near a parity, instead of 28 males to 10 females.

Of very great interest is the exceedingly small number attributed, or possibly attributable, to *ophthalmia neonatorum*.

#### Prevention.

Of the two important preventable causes, optic atrophy and trachoma, we may look forward with some confidence to a reduction in the numbers of the former due to plumbism. Modern treatment will also no doubt bring about a reduction in the numbers due to syphilis.

Trachoma is a disease that should not exist in a civilized community. Our best hope for its elimination lies in the hygienic enlightenment of those classes amongst whom it is prevalent in our dry inland areas. A reduction of blindness from this cause is to be anticipated from the activities of the Education Department and the arrangements for treating as well as schooling affected children in the Wilson Ophthalmic School Hostel in Brisbane.

ILLUSTRATIONS TO THE ARTICLE BY DR. R. A. MONEY.



FIGURE I.



FIGURE II.



FIGURE III.



ILLUSTRATIONS TO THE ARTICLE BY DR. I. DOUGLAS MILLER.



FIGURE I.

X ray photograph showing sellar changes, internal hyperostosis of frontal bone and intracranial calcification.

ILLUSTRATIONS TO THE ARTICLE BY DR. THOMAS G. MILLAR.



FIGURE I.

Skilgram taken before operation.



FIGURE II.

Skilgram taken after operation, showing lipiodol injected along the fistula into the cells at the apex of the petrous bone.

## Reports of Cases.

### A CASE OF INCLUSION CHONDROMA OF A METACARPAL BONE FOLLOWING TRAUMA.

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Alfred Hospital, Sydney.*

A MALE, aged thirty-nine years, was first seen on February 6, 1935, complaining of a tender swollen area at the distal end of the second metacarpal bone of his right hand, with inability to grip and to use the index finger. Four days previously he had been pushing his child along rather strenuously in the surf on a surfplane, using the radial border of his right hand, when he felt a sudden pain and something crack near the metacarpophalangeal joint of the index finger.

He stated that in 1918, whilst playing football with the Royal Air Force in England, he had fractured the right index metacarpal bone. It had not been recognized at the time and some displacement had occurred, as can be seen from the X ray print taken a few days later (Figure I). The displacement had remained uncorrected, and bony union took place rapidly, so that a prominence had always remained at the site of the injury. No disability had been felt prior to the present accident.

Examination revealed a very tender hard swelling on the dorsal and radial aspects of the distal end of the second metacarpal bone of the right hand. Some doubtful "egg shell crackling" was elicited dorsally. An X ray film revealed a fine pathological fracture which had occurred at a dilated and rarefied area in the bone, just at the site of the old fracture (Figure II).

Operation was performed the next day. The rarefied area was found to be full of hyaline cartilage, and the bone was thinned out like a piece of egg shell at the site of the recent fracture. The laterally projecting piece of bone was cut off with a chisel, the cartilaginous material was completely curetted away, and the piece of bone was dropped into the big cavity, thus remaining. The wound was sutured without drainage, and the hand and wrist were put in a plaster cast. The wound healed by primary intention, and after two months in the cast active use was allowed. A perfect functional result was soon obtained and has been maintained since. X ray films taken six months later showed that the cavity was being filled up by new bone, which appeared to be incorporating the small piece placed inside (Figure III).

A biopsy of the material removed at operation showed the presence of hyaline cartilage. The lacunae were irregular and the cells in them were small, without any evidence of proliferative activity. In a few areas calcification had occurred. In other areas the cells were larger and not in lacunae. The tumour was considered to be a simple chondroma. It is regarded as having developed gradually since the original injury and as being due to the inclusion and transplantation of one or more cartilage cells from the epiphyseal line at the distal end of the bone into the metaphysis of the shaft. The fracture involved this area, and as the patient was only twenty-two years of age at the time, this epiphysis would not have united to the shaft and the cells would still be active. These, being removed from their normal situation and from their normal control (hormonal or otherwise), would continue to grow and expand the bone to such a degree that fracture occurred after a minor injury.

### MENINGIOMA OF THE FRONTAL LOBE: TOTAL REMOVAL.

By I. DOUGLAS MILLER, M.B., F.R.C.S., F.R.A.C.S.,  
*Honorary Assistant Surgeon, Saint Vincent's Hospital;  
Honorary Surgeon, Mater Misericordiae  
Hospital, Sydney.*

THE following case is reported because it incorporates several features of considerable clinical interest and importance.

A.M., aged thirty-eight years, was referred to me complaining of paralysis of the right side of the face and failing vision. The paralysis of the face had commenced suddenly two months prior to my seeing him. He had been advised that the condition was a slight attack of Bell's palsy. It cleared up at the end of a week to some extent, though a degree of weakness had persisted. About a week after this was noticed he had commenced to experience a rather severe pain behind the right eye; this had been present every morning for an hour or so ever since.

About two months previously he noticed dimness of vision, and since then had been unable to read the daily paper. For about the same length of time he had been very apt to drop off to sleep at any time of the day. His memory had been somewhat impaired, and this, combined with drowsiness, had necessitated his giving up his usual occupation. He had recently increased greatly in weight. Beyond this there was no other relevant fact in the history.



FIGURE II.  
Tumour mass after removal.

On examination he had anosmia at the right nostril. Recognition of smell at the left nostril was unimpaired. There was marked bilateral papilloedema with some right-sided optic atrophy and with great reduction of acuity in the right eye. There was a slight right-sided lower facial weakness.

His manner and behaviour were normal, except for a certain facility of expression and proneness to break into a benign smile.

At this stage I had the impression that we were dealing with a meningioma of the right olfactory groove, the classical syndrome in such a case being homolateral anosmia and optic atrophy, and heterolateral papilloedema. X ray examination, however, gave us further information.

The stereoscopic studies were very instructive. There is evident in these some destruction of the posterior clinoid processes and an increase in size of the *sella turcica*. Taken out of conjunction with the clinical picture, one might imagine this to be a pituitary tumour, but the clinical signs negative this possibility. It is to be remembered that any cause of internal hydrocephalus may produce these sellar changes. In the right frontal region there is a definite hyperostosis of the inner table of the



FIGURE III.  
Sketch showing position of tumour  
(lateral view).

skull, combined with an increase in vascular markings. There is also a fine fleck of calcification leading back from the bone into the frontal lobe. On a flat plate this has no significance and may readily be missed, but stereoscopically it is seen to be suspended like a fine wisp of cloud in the centre of the right frontal lobe. This is an example of the great value of radiography and the necessity for stereoscopic pictures in the diagnosis of intracranial tumours.



FIGURE IV.  
Sketch showing position of  
tumour (view from above).

Under local anaesthesia, later supplemented by "Avertin", I turned down a large frontal osteoplastic flap. The bone cuts bled profusely, as is characteristic of the bone overlying meningiomata. Before opening the dura I attempted to reduce intracranial tension by tapping the ventricle, which I found to be small and displaced backwards. On opening the dura, I could not see the tumour, but I could feel it underlying the frontal cortex. As the brain looked like bursting, I rapidly resected the anterior part of the

frontal lobe, where it was overlying the tumour. This brought a large section of the tumour into view and I was able to remove its posterior portion, which was very soft, highly vascular and friable.

When this was done I found that I had opened into the anterior horn of the lateral ventricle. His blood pressure commenced to fall about this time, and after blood transfusion I decided to postpone removal of the remainder of the tumour. I left him with a large cavity in the frontal region and the intracranial tension greatly reduced. After closure another blood transfusion was given. His recovery was uneventful and rapid, and he was out of bed in eight days.

As he still had a marked secondary anaemia with a hemoglobin value of only 60%, I decided to send him away for three weeks and to give large doses of iron. At the end of this time he returned with a normal blood picture. His eye grounds were flat and he described himself as feeling much better than he had felt for a long time. It required a little persuasion to make him face another operation.

At the second operation the old flap was turned down again. It was surprising to find that the large cavity we had left was once again filled by brain, and this led to a little difficulty at first in defining the tumour. When this was displayed I removed it by endothermy "looping" and other manoeuvres in large potato-like masses. Its site of attachment was found to be the *dura mater* of the frontal

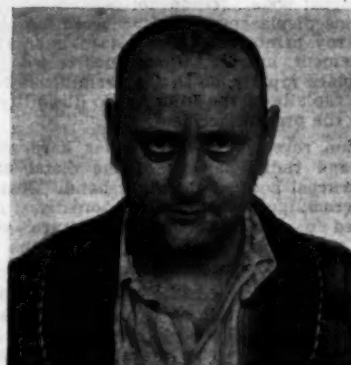


FIGURE V.  
Patient before discharge from hospital.

bone, just above the superciliary ridge. The tumour was totally removed and again a large cavity lined by compressed cortex was left. This was filled with Ringer's solution and the flap was closed.

This operation did not upset him at all, and he made a rapid recovery and was discharged from hospital ten days later. He is now quite well, his vision is normal, and he is mentally alert and back at his work.

The total weight of the charred fragments of tumour was 90 grammes, though its actual weight before removal would be considerably greater. Histologically it is a typical meningeal fibroblastoma.

#### Comment.

The particularly instructive features of this case are:

1. The extraordinarily few symptoms accompanying so large a tumour.
2. The importance of anosmia as a sign.
3. The homolateral facial paralysis, well recognized in frontal tumours.
4. The X ray findings, which to the unwary suggest pituitary tumour and which emphasize the great importance of stereoscopy and of a search for signs of intracranial calcification and hyperostosis of the skull, however insignificant.



# SUPPURATION IN THE APEX OF THE PETROUS PART OF THE TEMPORAL BONE SUCCESSFULLY DRAINED BY OPERATION.

By THOMAS G. MILLAR, M.B., B.S. (Melbourne),  
F.R.C.S. (Edinburgh), Dip.L.O. (England),  
Melbourne.

D.D., a FEMALE, aged eighteen years, complained on May 5, 1936, that she had had pain in the right side of the face and in the right ear for one day. She had had a sore throat during the previous few days. On examination her temperature was found to be 38.6° C. (101.4° F.) and the right eardrum was bulging. Under general anaesthesia a paracentesis of the right drum was done. There was a profuse discharge of thin purulent material.

Next day she complained of severe pain in the right ear. In the afternoon her temperature was 38.9° C. (101.8° F.) and the pain was worse. There was tenderness over the tip of the mastoid and oedema was present. Under general anaesthesia a simple mastoidectomy was done. Purulent fluid was obtained. The bone was very congested. There was a most extensive pneumatization, which extended into the occipital and squamous temporal bones. The large cavity that was left was packed with gauze soaked in bismuth-iodoform-paraffin paste and a rubber drain passed out through an opening between the skin edges, the upper parts of which were sutured with silk. Both antra were then washed out, mucopus being obtained from the right antrum, the left being clear.

On May 7, 1936, her temperature was 39.3° C. (102.8° F.) and she appeared to be very ill. There was much pain around the site of the wound, and there was very little discharge. During the next seven days the pain gradually diminished and the temperature fell to 37.25° C. (99° F.) in the evening.

On May 15, 1936, she had improved considerably. The sutures were removed from the wound. In the course of the next few days it was noted that there was an increased amount of discharge from the lower end of the wound. At this time there were occasional twinges of pain in the face.

On May 27, 1936, she complained of considerable pain in front of the right ear, in the right eye and also in the right side of the face. The evening temperature was 38.2° C. (100.8° F.). The wound behind the ear was reopened and a few ounces of pus were found. The cavity was packed with boric-iodide powder. During the next five days the pain persisted; but the temperature fell to 37.25° C. (99° F.) and the wound discharged freely. On neurological examination no abnormality was detected.

The report of X ray examination on June 1, 1936, was as follows:

Left mastoid is very highly pneumatized, with cell structure extending anteriorly into the zygomatic region. Large post-operative defect in right mastoid; the only area showing any cell structure is in the zygomatic group. Stereo films of base show a definite loss of translucency throughout petrous portion of right temporal with a disappearance of the cell septa, which are seen clearly in the normal side; the appearance being characteristic of a petrositis. Sinuses: except for some thickening of mucosa along lateral wall of the left antrum, the sinuses, including the sphenoids, are clear.

On June 3, 1936, the pain was somewhat less; but a right facial paresis had developed. She had become pallid, and blood examination disclosed that the haemoglobin value was 62%; the red cells numbered 4,400,000 and the leucocytes 11,100 per cubic millimetre. Iron and ammonium citrate were given in a dose of two grammes (thirty grains) three times a day.

On June 5, 1936, facial paralysis was more marked and the pain in the face and in the eye had increased in severity, necessitating aspirin and morphine on several occasions daily.

On June 8, 1936, under general anaesthesia, the wound was reopened. No obvious track into the tip of the

petrous bone was apparent. The residual zygomatic cells were radically removed and the full radical mastoid operation was completed. No peri-Eustachian fistula was present. The tegmen of the antrum, the aditus and the epitympanum were removed, and the dura was elevated from the superior surface of the petrous bone. A dark brownish cellular area of bone was noted just postero-superior to the lateral semicircular canal. This area was cut into and was found to lead inwards along the superior surface of the petrous bone anterior and superior to the superior semicircular canal. Just medial to the latter a gush of pus was observed; it was found to be coming from a fistula leading into the tip of the petrous bone superior to the internal auditory meatus. About fifteen cubic centimetres (half an ounce) of pus were obtained; the fistula was sucked out until no further pus was noted. The wound was packed with gauze in bismuth-iodoform-paraffin paste and left widely open.

Next day the patient was much more alert, and the pain had quite disappeared. On June 10, 1936, lipiodol was injected along the track. The report of the X ray examination then made was as follows: "After lipiodol injection, films show the lipiodol extending into the tip of the petrous; no evidence of any injection beyond this area."

On June 12, 1936, she was much better and the right facial paralysis was less marked. The electrical reactions of the face were tested, the report reading: "Both facial muscles and nerve give good faradic response, slightly less than that of the normal side."

The discharge from the cavity behind the ear gradually became less and her temperature remained normal.

On June 22, 1936, a plastic operation was performed on the mental wall, the radical mastoid operation being thus completed. Two days after this operation the patient complained of giddiness and vomited. Neurological examination did not disclose any abnormality, save the right facial paresis, which had almost cleared up. The symptoms disappeared when the packing was changed. Convalescence thereafter was uneventful.

## Comment.

A diagnosis of petrositis was suggested by the following: (i) the abnormally extensive pneumatization; (ii) the extraordinary amount of pain in the head after a simple mastoidectomy; (iii) the typical pain in the eye on the same side; (iv) increasing facial paralysis; (v) persistent pyrexia and increasing toxæmia; (vi) persistent profuse discharge from the operation wound and external auditory meatus. The diagnosis was confirmed by the X ray examination of June 1, 1936.

Operation was decided upon because of: (i) the constant severe pain in the eye, quite uncontrolled by sedatives; (ii) the increasing facial paralysis; (iii) the progressive decline in the patient's general condition, which had become grave.

## Acknowledgements.

I wish to acknowledge the assistance given me by Dr. L. E. Rothstadt, late medical superintendent of the Royal Melbourne Hospital, and by Dr. G. C. Scantlebury, who saw the patient with me in consultation on several occasions.

# SUPPURATION OF THE PETROUS PART OF THE TEMPORAL BONE.

By G. C. SCANTLEBURY, M.B., B.S. (Melbourne),  
F.R.C.S. (Edinburgh),  
Melbourne.

E.C., a MALE, aged twenty-five years, when seen on July 27, 1936, stated that six days previously he had had pain in both ears following a cold. The right ear had discharged spontaneously. A paracentesis had been performed on the left ear four days previously, in the country. There had been some pain around the left ear since the operation.

On examination the right ear was dry. There was a copious discharge of mucus from the left ear. The sinuses could be illuminated clearly. The nasal septum was deviated to the right; otherwise examination of the nose and throat revealed no abnormality.

On July 29, 1936, the discharge was very profuse from the left ear. The patient complained of pain over the left eye, radiating up over the parietal and occipital region and occasionally into the left side of the lower jaw. The pain occurred in spasms lasting about two hours; it was almost completely relieved by a mixture of aspirin, phenacetin and caffeine. The fifth, sixth and seventh nerves were all intact.

A full Schwartze operation was done. The mastoid, cellular in type, was very extensive, and the cells were grossly infected. The wound was partly closed and packed with gauze saturated with bismuth-iodoform-paraffin paste. Following operation there was a rise in temperature to 37.6° C. (99.6° F.) for two days. This was followed by normal pulse rate and temperature.

The pain persisted and became more intense. The post-auricular wound drained free pus from the attic region. An X ray examination showed slight clouding of the petrous part of the temporal bone and an abnormal area over the tegmen was interpreted as a slight raising of the dura in that region.

Owing to the persistence of the discharge and pain, the mastoid was reopened on August 21, 1936. The whole wound was explored and the attic exposed a little further forward. No signs of a collection of pus were found. The wound was left wide open and packed.

Following this operation the pain persisted and pus was seen to come from the attic region when the wound was repacked daily. The pulse and temperature still remained normal. No abnormality was found in the central nervous system. The fundi were normal. The patient was allowed out of bed; but the pain and discharge continued.

On September 12, 1936, a radical operation was completed, except for the plastic to the external meatus. In the absence of a track an approach to the petrous part of the temporal bone was made, antero-superior to the lateral canal. The dura was raised and the tegmen partly removed. At a distance of about 1.25 to 1.9 centimetres (half to three-quarters of an inch) medial to the lateral canal, still with a very thin layer of tegmen above, a cavity was opened into and there was a gush of pus. Altogether about fifteen cubic centimetres (half an ounce) of pus were drained. A glove drain was introduced to this area and stitched in place. The wound was left wide open and packed.

Following this operation the frontal pain disappeared completely. There was a paresis of the facial nerve due to the opening of the Fallopian aqueduct and exposure of the nerve at operation; but this disappeared in a few days. There were also a slight reactionary fever and an increase in pulse rate for two days. At no time was any more pus seen. The drain was removed on the fifth day and the wound repacked daily thereafter. Recovery was uneventful. The plastic operation was completed on December 4, 1936; the patient is now back at work.

The interesting points in this case are: (i) the afebrile course of the illness; (ii) persistence of the frontal pain; (iii) the complete absence of pus after evacuation; (iv) complete cessation of pain after evacuation; (v) absence of a track into the petrous part of the temporal bone; (vi) absence of paralysis of fifth, sixth and seventh cranial nerves before operation.

## Reviews.

### PRINCIPLES OF BIOLOGICAL CHEMISTRY.

PROFESSOR A. P. MATHEWS is well known to biological chemists through his comprehensive text-book, which has passed through several editions. Now this veteran has given us a "Principles of Biochemistry", in which he has

drawn upon the experience of his forty years' teaching of the subject in an attempt to present a coherent story.<sup>1</sup> In this attempt he has been remarkably successful.

His book should be welcomed, not only by the student seeking a clear and logical treatment of the subject, but also by the more mature reader, who will appreciate the able manner in which the author has selected his material. After a very useful introductory discussion, Professor Mathews has approached the subject through the carbohydrates. The biological chemistry of these compounds has been very well and fully treated. They play a fundamental part in biological chemistry, not only because they are the original organic compounds from which all others of biochemical importance are derived, but also because of the central part which they play in such important aspects of bodily activity as energy metabolism and absorption.

The section on lipides is probably least satisfactory from the point of view of the student. A system of classification is used which is so inclusive as to be confusing. The reasons for not using the more conventional, if slightly arbitrary, division into simple, compound and derived lipides is not obvious. Certain details of this section are open to criticism also. Surely it is going beyond the evidence to say that emulsified fats are "very largely" digested in the stomach and that they are hydrolysed "almost instantaneously" in the intestine.

In the section on proteins the nature of the different kinds of precipitation reaction is not adequately dealt with, nor is the important series of changes which end in heat coagulation clearly presented. Modern views of the physical chemistry of the proteins and, indeed, the physico-chemical side of biological chemistry in general receive disappointingly meagre treatment. One expects more attention to this important aspect of the subject in a book dealing with principles.

Animists are rare among scientific men of today. The present author is an outstanding example of those inclining to this point of view. His attitude of mind shows itself from time to time in the book, and is especially evident in the section on endocrine secretion, from the value of which, however, it does not in any way detract.

It is a pity that the author has abandoned the sectional references which are a feature of his larger work. Even in a book of the standard of the present work a few selected references would be of value to the student, especially as the current literature has been, on the whole, so well digested. Such criticisms as have been made, however, are directed to matters of detail, except with regard to the lack of adequate treatment of the physico-chemical aspects of the subject. Of the work as a whole it may fairly be said that for clarity of presentation of the biochemical side of the activities of the living organism, considered as a unit, nothing so satisfactory has appeared in English for many years.

### A GIFT BOOK FOR PARENTS.

"THE MOTHER'S ENCYCLOPEDIA", edited by L. Chaloner, is a most delightful collection of information on the upbringing of the young.<sup>2</sup> It is a complete reference book on the subject of home life, and it would be well if it superseded the bulky home medicine books which so often grace the shelves of an Australian household.

The encyclopedia contains 1,400 different articles on a range of subjects which are as varied as measles and Santa Claus. These articles are written by 130 men and women who are expert physicians, educationists and psychologists. It is unusual to find such a high standard maintained by all contributors to a volume such as this. The book is published in America, but the information even upon such subjects as schools is so sensible and

<sup>1</sup> "Principles of Biochemistry", by A. P. Mathews; 1936. London: Baillière, Tindall and Cox. Royal 8vo, pp. 522. Price: 20s. net.

<sup>2</sup> "The Mother's Encyclopedia" (British edition), edited by L. Chaloner; 1936. London: George Allen and Unwin Limited. Demy 8vo, pp. 692, with illustrations. Price: 3s. 6d. net.



fair-minded that it is quite applicable to conditions in other lands.

The commoner children's diseases are wisely discussed, and the nursing and treatment given are quite in accordance with modern methods. There is no attempt in any of the medical sections to encourage the mother to take the doctor's place.

The various phases of adolescent life are admirably treated, and parents will be much helped in the guiding of their offspring through this difficult period. The adolescent is dealt with from all aspects—his faults, his desires, his friends; and perhaps the most useful advice of all is contained in the article on sport for the adolescent. The writer here stresses the danger of excess and gives a complete list of suitable sports and their extent for both boys and girls.

The psychological articles are sound and in accordance with modern teaching. The spoiled child and the only child, of course, receive special attention, but the case of the only child is stated more hopefully than usual. "Cosmetics for Adolescents" is a section that will help mothers to understand their flapper daughters and to influence them wisely. Another good article is the description of a family conference. The case in point is that of a college student who wants to take the old family car back to college. The conversation between the lad and his parents is a model of how to deal with such a situation.

The paragraphs on sex education deal conventionally with the matter; and the book excels more in the way in which such subjects as shyness, speech training and holiday play are discussed.

A habit programme tells a mother exactly how her child at different ages should spend his day and night, and also mentions at what age he should be able to do various jobs for himself. All infant welfare work is included, but that is not so interesting, as a multitude of good books are published on this subject. The psychologists all lay stress on the evil that is done to childish minds by broken homes, and the need of every child for two parents to share in his upbringing.

The numerous illustrations are all delightful reproductions of photographs of children absorbed in a variety of occupations and add to the interest of the book. The encyclopædia would be an excellent gift for any parent; it is literally a complete compendium of knowledge, written attractively, on the subject that is nearest every true parent's heart.

#### ALLERGY.

"ALLERGIC DISEASES, THEIR DIAGNOSIS AND TREATMENT", by Roy M. Balyeat, has reached its fourth edition.<sup>1</sup> Previous editions have been revised and much new material added. Balyeat's original idea of writing a simply worded book that can be understood by the average patient has been kept. The book is of value to patient and doctor alike. The author points out that specific sensitivity to proteins is acquired, but the ability to become specifically sensitive is inherited. Practically all cases of seasonal hay fever and asthma are caused by pollen from the wind-borne pollinated plants growing in the locality. It is possible for a patient with perennial hay fever to have symptoms from pollen only and for the symptoms to continue throughout the year.

Food is largely the cause of those cases of asthma that begin within the first eighteen months of life. Seldom does food play the sole part in the cause of asthma when the trouble did not start within the first decade of life. Lists and illustrations of some of the common grasses and weeds known to produce symptoms are given. The amount of pollen in the air depends upon the wind velocity, the amount of sunshine, the humidity and the abundance of growth of the wind-borne pollinated plants. The extent to which an individual is exposed to any given pollen (or

other allergen) largely determines whether or not a sensitivity to that particular pollen (or other allergen) will ever develop. Cats, dogs, rabbits and other pets may cause hay fever and asthma, also cattle, horses, fowls *et cetera* are common causes. Patients sensitive to house dust should have their pillows and mattresses covered with rubberized sheeting. Face powders, talcs, bath salts may be dangerous on account of the orris root content.

A differential diagnosis of asthma is given, and Balyeat points out that a careful history of the onset of symptoms and the type of breathing will usually differentiate true bronchial asthma from symptoms due to pressure. Asthma is a common complication of perennial hay fever. Food is not an uncommon cause of nasal symptoms, and wheat is the commonest of all foods that cause trouble.

With few exceptions results in the treatment of perennial hay fever and asthma are more satisfactory than the treatment of any other chronic disease. In a large percentage of true asthma cases of long standing there is superimposed a bacterial infection of the bronchial tree.

The medical attendant should be sure that enlargement of the turbinates is not due to a sensitivity to some protein such as pollens, animal dandruff, dusts *et cetera* before they are removed. Balyeat asserts that many needless surgical measures are carried out on allergic people. Too much ventilation of bedrooms is not indicated in asthma and hay fever, and open air bathing, in his opinion, is harmful.

Nose-rubbing and nose-wrinkling in children are often significant of an allergic condition of the nose. Children who suffer from nasal allergy are usually mouth-breathers and often have dental and palate deformities. Testing is done by scratch, intradermal and patch methods. The leucopenic index is a valuable test in food-sensitive patients. A nasal smear-test for eosinophile granules may be of definite value.

The majority of asthma and hay fever patients, Balyeat affirms, can either be cured or relieved of their attacks, and it makes no difference where they live. Drug treatment for relief of asthma is discussed; iodized oil is highly recommended and is described in detail. The author condemns nasal ionization as having no place in treatment. Allergic conjunctivitis is described, and pollen, hair oil and cosmetics are found to be causal agents. Gastro-intestinal allergy due to food is more common than is usually supposed.

Migraine is fully discussed and is stated to be usually due to foods which should be eliminated from the diet of the patient for a while. Urticaria may be due to chemicals, plants, animal epidermals, heat, cold, foods, drugs and infections. The allergic dermatoses are usually found to be due to foods and cosmetics.

At the end of the book are a number of menus for patients who are sensitive to food. A choice of dishes to replace the foods omitted from the diet is given.

In his preface to the third edition of "Recent Advances in Allergy"<sup>2</sup> the author, Dr. G. W. Bray, indicates that "in addition to the revision of each chapter, those dealing with psychological and nasal factors, as well as with cutaneous, nasal and drug allergy, have been rewritten to a great extent; many sections dealing with practical treatment largely amplified; new elimination diets and physical exercises included; and new references to agranulocytic angina, parotid swellings, *acne vulgaris* and allergy to yeasts added".

We wholeheartedly agree with him that it would be stupid and futile to argue that all cases of asthma are due entirely to psychopathic states. Hurst emphasizes that no amount of suggestion can produce anything more than tachypnoea without any evidence of contraction of the bronchioles in anyone who has not the asthmatic diathesis.

The author is probably correct when he states that under the influence of emotional excitement the quantity

<sup>1</sup> "Allergic Diseases, Their Diagnosis and Treatment", by R. M. Balyeat, M.A., M.D., F.A.C.P., assisted by R. Bowden, B.A., M.D., F.A.A.P.; Fourth Edition, revised and enlarged; 1936. Philadelphia: F. A. Davis Company. Demy 8vo, pp. 631, with illustrations.

<sup>2</sup> "Recent Advances in Allergy (Asthma, Hay-Fever, Eczema, Migraine, etc.), by G. W. Bray, M.B., Ch.M., M.R.C.P., with foreword by A. F. Hurst, M.A., M.D., F.R.C.P.; Third Edition; 1937. London: J. and A. Churchill Limited. Demy 8vo, pp. 532, with illustrations. Price: 15s. net.



of allergen formerly below the threshold may be increased in stimulant value and then may become effective so that "the psychic trauma was merely the trigger that fired the already loaded allergic gun". The question of the place of nasal surgery in the treatment of asthma is considered at some length, and the general conclusion is that 14% of asthmatics derive benefit from such procedures. In most cases the general allergic condition is the cause of the abnormal state of the nose, and the pathological state of the nose is not the primary cause of the asthma. The treatment should be first directed to the allergic condition as such, and if this does not respond to treatment, then, and then only, should nasal surgery be considered. In discussing allergic coryza, the author states that he finds a course of specific desensitization always effective. He must be regarded as fortunate in this respect, as he refers to a long list of palliative methods of treatment which are adopted by many other allergists. It is the experience of Australian workers that desensitization to the mixed inhalants of allergic coryza is much less satisfactory than in pollen allergy. We view with particular interest the statement that in the treatment of pollen allergy an attempt is made to reach a final dose of at least two cubic centimetres of a 5% solution of the pollen to which the patient is sensitive, that is, a dose of 100,000 units. It seems that in the past the failure of many patients to respond satisfactorily to treatment was due to the fact that the final dose obtained was not sufficiently large to give the requisite immunity. The author recommends that if an asthmatic patient cannot take much fluid by the mouth, a glucose-saline enema (three ounces of glucose to a pint of normal saline solution) should be given, and that this will serve as a source of food. The experimental evidence in various laboratories is that glucose is not absorbed from the large intestine, and hence a glucose enema cannot be regarded as a source of food.

The book is altogether exceedingly well compiled and deserves a wide circulation. It is invaluable as a source of references to other literature on the subject.

#### TWO BOOKS ON DIETETICS.

It is doubtful whether the medical practitioner who likes his information in readily accessible form, will find much real help in a book on applied dietetics by Sanford Blum.<sup>1</sup>

The nutritional principles underlying the recommended diets are somewhat obscure, and in many places are conspicuous by their absence. Some of the items, while intelligible to an American reader, would convey nothing to an Australian. Examples of these are noodles, pumpnickel bread, flax seed tea and couch grass tea.

Under the heading of "Inorganic Elements Essential to Nutrition" it is stated that "calcium, phosphorus, sodium, potassium and magnesium evidently are requisite in considerable but unknown quantities for normal bone formation and growth". Such a statement, referring particularly to calcium and phosphorus, would seem to deny the very valuable advances that have been made by Sherman and others in our knowledge of mineral requirements.

Throughout the book some extraordinary terms are used. For instance, there is one diet described as a "normal careful diet". In another place a diet is prescribed for a "torpid liver". A diet is prescribed even for an opium addict. The author has shown himself to be out of step with modern spelling by using the final "e" in vitamin.

We note the prescription of a diet for an eighteen-months-old child suffering from a lymphatic diathesis. It is noted that sausage is contraindicated in arteriosclerosis. The author's diet for typhoid fever in the second and third week contains two ounces of whisky per day, and no attempt is made to emphasize the necessity for high calorie diets in such a condition.

In the diet for pregnancy no reference is made to the fivefold increase in the requirements of the pregnant

<sup>1</sup> "Applied Dietetics for Adults and Children in Health and Disease," by S. Blum, A.B., M.S., M.D.: 1936. Philadelphia: F. A. Davis Company. Royal 8vo, pp. 419.

woman for the vitamin B complex, nor is any statement made of the calcium needs (at least 1.6 grammes per day) or the phosphorus needs (at least 2.0 grammes per day) in an available form.

This publication is not a helpful contribution to the subject; it would achieve its best purpose as a reconstruction of the dietetic ideas of ten years ago.

Quite an outstanding application of the modern knowledge of the physiological nutritive requirements of the body to everyday medical practice will be found in "Applied Dietetics", the planning and teaching of normal and therapeutic diets, by Frances Stern.<sup>2</sup>

Frances Stern has been the chief of the food clinics of the Boston Dispensary since 1918. The characteristic of this book is its fundamental soundness. The benefit is given of a rich and varied experience in the application of these underlying principles. The word "practical" achieves a new significance when applied to this work, because throughout the book the experience gained in everyday practice is writ large on every page.

Scientific dietitians of the type of Frances Stern have achieved an established position in therapeutics, and such a type is indeed welcome as the physician's right-hand man.

One of the most valuable parts of the book are the tables that simplify the computation of the diet. Such extensive nutritional data have been accumulated in the past few years that the earnest student must soon become embarrassed; these tables assemble this knowledge in a readily accessible form. We have not seen similar tables except in scattered references, and many of them are published for the first time.

Also in the book are some very valuable typical diets and menus, such as the food requirements of pregnancy and the ketogenic diet. The author presents the principles of nutrition underlying the planning of normal and therapeutic diets. He discusses environmental conditions that may influence the effectiveness of the diet. He describes methods and materials that are helpful in the education of the patient, in terms of his mental capacity and his ability to carry out the diet. He includes a series of dietary outlines showing that the therapeutic diet is but a modification of the normal diet, compensating for changes in the body caused by disease or abnormal conditions.

We feel that a new era in dietetics has been begun by the publication of this book. The new era, of course, is dominated by the physiological nutritional needs of the body. The applications of these principles to the therapeutic diet is a progressive move that is almost revolutionary and definitely outmodes previous publications on the subject.

#### STARLING'S PHYSIOLOGY.

PROFESSOR LOVATT EVANS has, in the seventh edition of "Starling's Principles of Human Physiology", made a thorough revision throughout the text and seems to have omitted little, if anything, of importance.<sup>3</sup> Recent work on the chemistry of hormones and vitamins, the humoral transmission of nerve impulses, the carriage of carbon dioxide in the blood and the formation of urine, is well summarized.

The book is so well known that it is quite unnecessary to comment further on its contents beyond stating that Professor Lovatt Evans is keeping up and indeed improving the high standard set by Professor Starling. There are over one thousand pages of text, and it is not always easy reading; still, as an advanced text-book and as a work of reference on all branches of physiology, it has no equal.

<sup>2</sup> "Applied Dietetics: The Planning and Teaching of Normal and Therapeutic Diets", by F. Stern: 1936. London: Baillière, Tindall and Cox. Super royal 8vo, pp. 285, with 52 tables. Price: 16s. net.

<sup>3</sup> "Starling's Principles of Human Physiology", edited and revised by C. Lovatt Evans, D.Sc., F.R.C.P., F.R.S., LL.D., and H. Hartridge, M.A., J.D., Sc.D., F.R.S.: Seventh Edition: 1936. London: J. and A. Churchill Limited. Royal 8vo, pp. 1109, with 554 illustrations. Price: 24s. net.

## The Medical Journal of Australia

SATURDAY, MAY 22, 1937.

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### PROFESSIONAL JEALOUSY.

IN the concluding sentences of a chapter on professional jealousies, Robert T. Morris, in his interesting book, "Fifty Years a Surgeon", expresses the opinion that professional jealousy is becoming less—that the doctor's attitude toward his colleagues is becoming as sound as his belief in science. In the larger cities, as Osler said many years ago, professional jealousies are dying out; they are, more is the pity, not yet dead. In smaller centres, particularly in country towns, jealousies flourish most of all; here people have so little to do that gossip about their neighbours comes readily to their lips, and medical practitioners are so few that one man's success has greater effect on his brother practitioners' clientele than would be noticeable if there were more to provide a field for his successful effort.

Probably most people would prefer to live in peace and concord with their neighbours, but amity is easily upset. Individuals, like communities and nations, are often set at enmity by something affecting their pockets. A practitioner, for example, settles in a country town. Already several older practitioners are making a living, maybe a good

living, in the place. Unless the newcomer buys a practice, he is liable to be avoided by those already established in the town; the "old hands" may even refuse to meet him in consultation. This active opposition will more likely than not be carried on year in and year out, no matter how long the newcomer may choose to stay. Generally the newcomer is young, enthusiastic and *au fait* with the latest methods of diagnosis and treatment. In the face of behaviour unworthy of the members of a learned profession, it will require much balance and more than a little sense of humour if he does not retaliate. The older practitioners forget that there was a time when they had to start to make their way in the world, and when patients left other practitioners to come to them. They forget that they should set an example to younger men. Most important of all, they forget that by their unworthy attitude they may jeopardize the safety of a patient. Another source of professional jealousy arises when a second practitioner corrects a wrong diagnosis made by another. The second practitioner need not be cock-a-hoop about his achievement and will do well to refrain from slighting his brother practitioner—he never knows when the tables will be turned.

Osler found three causes for quarrels among doctors. The first was lack of proper friendly intercourse "by which alone we can know each other". Medical meetings and discussions offer opportunities that should be exploited as far as possible—not so much the meetings themselves as the informal talks before and after the meetings are held. In a larger way congresses serve to bring together practitioners of widely separated areas. In country districts local medical associations or subdivisions of Branches of the British Medical Association are excellent means of making practitioners known to each other. When, as has been done in at least one district, the new arrival in a town is deliberately omitted from all communal effort except when a subscription is to be collected, the position is a little difficult and special steps need to be taken to meet it. Osler's second reason was uncharitableness, described by him as "the most prevalent of modern sins, peculiarly apt to beset all of us, and the chief enemy to concord in our ranks". We can do no

better than quote Osler: "Oftentimes it is a thoughtless evil, a sort of tic or trick, an unconscious habit of mind and tongue which gradually takes possession of us. No sooner is a man's name mentioned than something slighting is said of him, or a story is repeated which is to his disadvantage, or the involuntary plight of a brother is ridiculed, or even his character is traduced." There is in truth a tragic element in this vice, and it has a debasing influence on the character of those who indulge in it. Osler's third cause of jealousies is the wagging tongue of others. Any man is foolish who listens to the tales of a patient about a brother practitioner. Moreover, from the preventive point of view no medical practitioner should repeat either to the men or women of his acquaintance, however well he may know them or think he can trust them, any story that he may hear about another practitioner. Perhaps the best conclusion to this discussion may be made in the words of Sir Thomas Browne, also quoted by Osler:

Moses broke the tables without breaking the law; but where charity is broke the law itself is shattered, which cannot be whole without love, which is the fulfilling of it. Look humbly upon thy virtues; and though thou art rich in some, yet think thyself poor and naked without that crowning grace, which thinketh no evil, which envieth not, which beareth, hopeth, believeth, endureth all things.

### Current Comment.

#### THE MECHANISM OF THE LOSS OF HEAT FROM THE BODY.

THE adjustment of heat production to loss and of loss to production is of major physiological importance. The regulation of the two and the adjustment of body temperature in health and disease are problems that must be considered by every clinician, though their investigation presents unusual technical difficulties.

The means of losing heat from the body are by radiation, conduction, convection and vaporization; heat is also lost in the urine and faeces. Heat is lost from warm-blooded animals because in general their temperature is higher than that of their environment. Du Bois, in the third edition of his "Basal Metabolism in Health and Disease", states that if the environmental temperature rises above that of the body the only channel of heat loss is through the vaporization of water, and if this were continued for a long time the animal would be required to consume large quantities of water to provide for sweating and the vaporization from the

lungs. Life would be possible, but the structures and functions of the various organs would be quite different from those found in existing homeotherms.

Under ordinary conditions of life little heat is lost through conduction by means of solids, because civilized man has surrounded himself with poor conductors of heat, such as clothing, wooden furniture and non-conducting mattresses. Just how much heat is lost by conduction would be difficult to estimate.

The term convection is used to describe the heat lost in the moving currents of air or water that happen to surround the body; convection is much more important than conduction. It is difficult to measure, and its laws are but poorly understood. It is perhaps the least understood factor in all metabolism work, yet everyone knows that he is cooled by a draught of air, and unconsciously adjusts his losses by convection. Inasmuch as the loss by convection may range from 5% to 40% of the total, it is possible to save or lose between 3 and 120 Calories per hour, depending upon activity, clothing and draughts.

Du Bois points out that convection is hampered but little by ordinary light clothing; in fact clothing seems to diminish the percentage loss by radiation and to increase the percentage loss by convection. Lightly woven materials are permeable to air and carbon dioxide and water vapour. The movements of the body drive the air in and out of the clothing, and when a person's metabolism increases suddenly on exercise, there is of necessity an increase in the rush of air around the moving parts, so that heat loss rises in proportion to heat production.

Physicists have found near the surface of inanimate objects a thin border zone of warm air in which there is little convection, and this constitutes a sort of enclosing membrane of molecules through which heat passes by conduction before it reaches the outer zone of convection. Hardy has pointed out that it is difficult, if not impossible, to measure the temperature or thickness of this "border zone" or "private climate". No thermometer can be placed within six millimetres of the skin without being greatly affected by the heat of radiation from the surface.

Du Bois states that it is impossible to make any quantitative estimate of all the factors affecting convection. The most important factor is the extent of air movement at the body surface. Humidity of the air is important because active vaporization of water from the skin aids in setting up currents of air. It is quite possible that in man the greatest convection is found between the legs or between the arms and the sides of the body, the very places where radiation is the least. Two warm surfaces close together may act as a chimney. A group of people standing close together may perhaps start an upward current of air much greater than the total of the currents formed when they are separated. Large bodies have proportionally greater convection than small bodies. Du Bois asks whether this is a clue to the puzzling question as to why



small animals, like mice, have a lower metabolism per unit of surface than large animals, like horses.

Turning to vaporization, Du Bois points out that the air that we breathe comes into immediate contact with the nasal mucosa and upper respiratory passages and is promptly warmed to body temperature and almost saturated with moisture. It would be expected that much heat would be lost in this way, but the specific heat of air is so low that one kilocalorie will warm 205 litres of air from 20° C. to 37° C. The total amount thus lost depends upon the temperature and humidity of the air and the rate of ventilation of the lungs. Du Bois writes:

Exercise with its increased heat production brings an increased heat loss through the warming of air in the respiratory passages, but this is insignificant compared to the enormous loss by vaporization. Under ordinary conditions a man loses about 12% of this total heat in the vaporization of water from the air passages. Just how high the percentage can rise I do not know, but on a hot day dogs can dissipate practically all of their heat in this manner. It is an economical method in comparison with sweating, since it involves no extra circulation through the skin and no loss of sodium chloride. The total surface area of the lungs plays no physiological rôle in the loss of heat, since practically all this takes place before the air reaches the small bronchi. Some authors have tried to include the enormous surfaces of the lung alveoli in the physiological surface of the body, but this seems illogical.

Vaporization of water from the surface of the skin and from the lungs is one of the most important channels of heat loss and it is under better physiological control than any of the others. Ordinarily it accounts for about one-quarter of the total dissipation. In a fog or on a rainy day, when the humidity is 100%, there is a much smaller loss, but when the temperature of the atmosphere is lower than that of the body there is always some loss, because air saturated at 20° C. will take up much more water vapour when it comes into contact with the skin at a temperature of 33° C. or with the respiratory passages at a temperature of 37° C. In an atmosphere warmer than 36° or 37° C. and a humidity of 100% there is no loss of heat from the human body and fever inevitably results. On the other hand, if the atmosphere is 35° C. or over and the humidity below 70 or 80% the body loses all of the heat produced through vaporization and may even lose in this fashion the extra heat that passes into the body by means of radiation and convection.

Sweating is the physiological mechanism that comes into play when the temperature of the air reaches a certain level or when the heat production has risen beyond the point where it can be taken care of easily by the ordinary methods of heat loss. It is only the vaporization of sweat from the surface that counts; the dripping of sweat is pure waste unless it serves to moisten clothing and then evaporate.

After discussing insensible perspiration and the difficulty of measuring skin temperatures, Du Bois deals with radiation, which he describes as the most important channel of heat loss. It is affected by the amount of vaporization, conduction, convection, and by the temperature of the skin and environment. Du Bois thinks that no one at the present time knows all that is to be known about radiation and heat loss. The amount of radiation depends not only on the extent of the effective surface, but also on the character of the surface. The "perfect black body radiator" is used as the standard which radiates 100° of its given temperature, absorbs 100° of the radiant energy and reflects no heat. The skin is one of the most perfect of all black

body radiators, and this means that all of its radiation comes from its surface and that none is transmitted from the subcutaneous tissues; the amount of radiation depends upon the temperature of the surface. A great many people, Du Bois points out, have made the mistake of thinking that our bodies radiate to the surrounding air. As a matter of fact, radiation passes through the air and we radiate to the nearest object that is sufficiently "black" to absorb the rays. A man sitting in a heated room in winter time loses a moderate amount of radiation to the ceiling, loses much more toward a cold window pane, and receives radiation from the steam heater. A naked man is the easiest subject for radiation experiments; clothing adds complications. The skin radiates to the inside of the underclothing, which is practically impermeable to radiation, but very easily permeable to convection and to vaporization. The underclothing is warmed by radiation and convection and in turn reradiates toward the outer clothing, but loses much of its heat by convection. The outermost layer of clothing is considerably cooler than the surface of the skin, and, as it is not such a perfect black body, it loses a smaller percentage by radiation and a larger percentage by convection. Convection is ineffective if the clothing is impermeable or if the temperature of the air is close to that of the skin. If the air temperature is above 36° C., convection leads heat into the body instead of away from it. Then vaporization by means of profuse sweating is the sole method of heat dissipation, and it serves to keep the skin cooler than the interior of the body. Unless the skin is at a temperature of about 35° C. there is not enough of a gradient from the interior at 37° C. to maintain a level of temperature, no matter how great a circulation is diverted into the subcutaneous tissue. If the vaporization is hampered by impermeable clothes or by a relative humidity in the neighbourhood of 100% in air above 35° C., there is no possible method of heat loss, and body temperature must rise.

This abstract of what Du Bois writes on heat loss in the new edition of his well-known book, is admittedly inadequate, but it will, we hope, stimulate clinicians to study the subject. They can do no better than buy and read his book. It will be of interest to those who would put bronchitic children into a steam tent or would nurse pneumonia patients in an artificially heated room. Du Bois also points out that in recent years clinicians have used all sorts of methods to raise body temperature in paresis, arthritis, gonococcal infections, and other conditions. The simplest method, he holds, is to put the patient in a hot bath or in a cabinet warmed by electric lights and filled with water vapour. The same thing can be accomplished more gradually by wrapping him in warm blankets and surrounding them with a rubber sheet. If a man weighs 70 kilograms, it takes 58.1 calories to raise his body 1° C. and he produces enough heat in his own body to accomplish this in an hour, provided all channels of loss are blocked.

## Abstracts from Current Medical Literature.

### SURGERY.

#### Gastric Ulceration and Carcinoma.

M. W. COMFORT AND W. L. BUTSCH (*The American Journal of Surgery*, March, 1937) attempt to evaluate statistically the various symptoms and laboratory findings in relation to the differential diagnosis of benign and malignant small lesions of the stomach. The material studied included 135 small gastric cancers and 513 benign gastric ulcers treated surgically at the Mayo Clinic between 1926 and 1930. In the detailed study only lesions less than 4.4 centimetres in diameter were included. The authors found that the chances were four in five that the lesion was benign, on the basis of incidence alone. It was also found that the patients of either sex and of all ages less than seventy years had benign ulcer more frequently than cancer. Whatever the duration of symptoms, the type of history or the concentration of free hydrochloric acid, and whether or not a change in symptoms, or retention, or occult blood in the gastric contents had occurred, the lesion was benign more frequently than it was malignant. In other words, a small gastric lesion has a greater chance of being benign, provided the age of the patient is less than seventy years, regardless of the duration of symptoms, type of history, or degree of concentration of free acid present, and whether or not retention of gastric contents or change in symptoms has occurred. This is especially true when the patient is less than thirty years of age (20:1), when the symptoms are of the ulcer type (5.6:1), when the symptoms are of ten years' duration or longer (12:1), and when the concentration of free hydrochloric acid is greater than 60 clinical units (51:1). A small gastric lesion is almost certainly benign when the duration of symptoms is longer than twenty-five years (21:0), when 30 or more clinical units of free acid are present in the gastric contents, and when the lesion is smaller than 1.7 centimetres in diameter (15:1). This becomes less true as the age of the patient increases, the duration of symptoms and degree of concentration of free hydrochloric acid decrease and when the history is of the irregular ulcer or non-ulcer type. It is interesting that the presence of occult blood in the gastric contents and a change in symptoms, findings credited with considerable importance in favouring the diagnosis of cancer rather than ulcer, actually do not favour the diagnosis of cancer, and favour ulcer very slightly, if at all. Most interesting perhaps is the finding that only if the patient is more than seventy years of age, if achlorhydria is found, and if the lesion is larger than 2.5 centimetres

in diameter, is there positive, statistical evidence in favour of malignancy, and even then the chance of the lesion's being cancer is only two or three to one. The authors conclude that the presence of any single clinical or laboratory finding does not justify at this time a diagnosis of cancer or benign ulcer when the diameter of the lesion is less than four centimetres. The finding may strongly favour one diagnosis or the other, yet there is always a chance that the diagnosis is incorrect. X ray diagnosis of cancer must always be taken seriously, even if the clinical data do not suggest cancer, and prolonged medical treatment is seldom justified when the lesion does not promptly disappear, even when one is reasonably certain it is benign, so long as skilled surgery offers a rapid restitution of health at a comparatively small risk.

#### Cholesterosis of the Gall-Bladder.

W. A. MACKAY (*The British Journal of Surgery*, January, 1937) presents a review of the subject of cholesterosis of the gall-bladder supplemented by personal observations of 87 cases. "Cholesterosis" is the term applied to a common condition in which the mucosa of the gall-bladder is infiltrated with lipid substances. In its nature it is related to the xanthomata. It is not a specific lesion, but rather a histological feature that may occur at random in gall-bladders showing all grades of pathological change; in fact, apart from lipid infiltration, many are normal. In the presence of advanced inflammatory or degenerative changes cholesterosis is rare. It is probable that the gall-bladder has the power of resorbing cholesterol from the bile. When the cholesterol is unusually abundant the process may become, as it were, visualized, and cholesterosis result. Should the amount of cholesterol in the bile diminish later, it is probable that the cholesterosis may disappear. The gall-bladder showing simple cholesterosis rarely harbours a demonstrable organismal infection. In one-third of the cases of cholesterosis gall-stones occur; these are almost always of cholesterol-rich types. The cholesterosis and the stones are not respectively cause and effect, but are parallel results of supersaturation of the bile with cholesterol. Cholesterosis betokens a state of affairs in which gall-stones are apt to be formed; but it is not otherwise of clinical significance. Cholesterosis does not, *per se*, produce symptoms; consequently the mere presence of lipid infiltration of the mucosa of the gall-bladder does not justify cholecystectomy, nor does it support a prediction that the clinical result of this operation will be gratifying.

#### Arteriotomy.

RENÉ LERICHE, RENÉ FONTAINE AND S. M. DUPERTUIS (*Surgery, Gynecology and Obstetrics*, February 1, 1937) report 78 operations for excision of

portions of arteries for five different diseases, and also give their conclusions after following the patient's progress for a varying period. Treatment of vascular disorders by resecting obliterated arteries is not new; but the authors believe that the treatment has not received sufficient attention in recent years. Leriche published some results as early as 1917. His earliest cases concerned gun-shot wounds in the Great War. He believed that the pain, swelling, cyanosis and trophic ulcerations were due to nervous influences following upon occlusion of an artery, and not simply due to diminution in blood supply. Lewis and Reichert noted prompt relief of pain and absence of gangrene following limited arteriotomies in 1926. Collateral circulations are more rapidly established after arteriotomy than after a simple ligation. Stricker and Urban, experimenting with dogs, were able to remove all the large arteries of the hind limbs, including even the iliac arteries and the bifurcation of the aorta. In some instances they have also removed the arteries of the anterior limbs, literally producing dogs without arteries. Such animals were just as active as normal dogs. The authors found that a collateral circulation after arteriotomy became established in approximately half the time required for its establishment after ligation. Massive arterial resection in one stage led to apparent gangrene unless the lumbar sympathetic chain had been removed prior to operation. Speaking from experience of the surgery of arteriotomy extending over twenty years, the authors claim better results in cases of monarteritis, such as follow trauma, freezing, surgical ligation or embolism. These are obtainable in the generalized vascular diseases, such as *thromboangiitis obliterans*. Terminal conditions associated with gangrene are unsuitable. Lumbar sympathectomy is sometimes performed prior to the excision of a segment of the artery. Arterial resection has a much lower mortality rate than the extensive operation of lumbar sympathectomy. Operations on the femoral and brachial arteries have given the best results. When good collateral vessels can be demonstrated, the external iliac, the subclavian and the femoral arteries in Hunter's canal are amenable to resection. Simple occlusion of a vessel gives rise to intermittent claudication; but where the obliterative process involves the outer layers of the vessel, the later symptoms and signs of intractable pain, trophic ulceration and gangrene become manifest. To localize the site and extent of occlusion the authors inject a radio-opaque thorium compound of German manufacture known as "Thorotrast". The authors emphasize that the finer results are obtained from the more extensive resections, for example, 15 to 20 centimetres of the femoral artery. The authors conclude that the operation is indicated in localized arterial occlusion of the



extremities. They believe that an obliterated artery functionally ceases to be an artery and becomes a diseased plexus of sympathetic nerve fibres provoking distal vasospasm. Their follow-up studies show relief of symptoms for one to ten years in approximately 50% of cases.

#### Catgut in Relation to Abdominal Wound Disruption.

HILGER PERRY JENKINS (*Surgery, Gynecology and Obstetrics*, March, 1937) discusses the factors influencing abdominal wound disruption. He has reviewed 1,294 cases, including 36 recent ones from the University of Chicago Surgical Clinic. The primary disease necessitating operation was malignancy (25%), diseases of the biliary tract (12%), appendicitis (6%), peptic ulcers (15%) and gynaecological conditions (18%). The average time elapsing between operation and disruption was eight days. The mortality of disruption was 35%. The author has grouped the factors leading to disruption under three headings: first, those attributable to the surgeon, including faulty knotting, the use of non-pliable catgut, the use of too much catgut, and the employment of a continuous suture adjacent to drains or tension sutures; secondly, the factors attributable to the patient, concerning delayed healing of the wound, undue strain on the healing wound from chest complications, sepsis, or uncontrollable conduct; thirdly, factors attributable to the suture material, including damage to the catgut from instruments, or soaking in hot water, rapid digestion as a result of sensitivity to catgut protein or chromic acid, and the presence of infection. The author found that chromic catgut of some brands was digested in six days, while that of other brands lasted twenty days. The so-called forty-day chromic catgut usually lasted a few days longer than the twenty-day chromic catgut of the same brand. Plain catgut of different brands lasted five to six days by the tension suture test, and when used for the seton test it became untied in the tissues and could be lifted out in two or three days. Chromic catgut of some brands may be very rapidly digested in the absence of perceptible suppuration. The author concludes that there is a definite place in surgery for some absorbable suture material that can be depended upon to maintain its tensile strength for at least twenty days.

#### The Treatment of Perforated Duodenal Ulcers.

ROSCOE R. GRAHAM (*Surgery, Gynecology and Obstetrics*, February 1, 1937) surveys the treatment of perforated duodenal ulcers at the Toronto General Hospital from 1929 to 1935. The group consisted of 46 males and 5 females; the ages varied from sixteen to eighty-two years. In seven cases only was perforation the initial symptom. The average time elapsing between perforation and admission to

hospital was only seven hours. Apart from the usual abdominal symptoms, pain in the right shoulder was a very common complaint. In the differential diagnosis, acute appendicitis, acute hæmorrhagic pancreatitis, and coronary thrombosis must be given pride of place. Acute appendicitis may be simulated because of the leaking contents' trickling down the right paracolic gutter and accumulating near the caecum. The author disclaims any responsibility for attempting to cure the ulcer. "Save the patient from the emergency" should be the surgeon's only thought. If the patient is dehydrated, cold and shocked, at the time of admission to hospital, operation must be delayed for a few hours until his condition is improved by heat, sedatives and intravenous fluid. The author advocates spinal analgesia for the performance of the operation, hoping thereby to diminish the dissemination of the duodenal contents by the wide excursion of the diaphragm caused by inhalation anaesthesia. Three interrupted catgut sutures are used, including a piece of omentum in their grasp. The sutures are loosely tied so that the piece of omentum is not cut or damaged. No further exploration should be attempted. Gastro-enterostomy is unnecessary and is therefore meddling. In eleven cases only in this series was drainage used after the operation. Cultures were attempted in 30 of the 51 cases. In 20 no organisms were grown, and in only one was a pathogenic organism cultured—the typhoid bacillus in pure culture. There was only one post-operative death; the patient had a massive pulmonary embolus arising from the left femoral vein. There was one subphrenic abscess, followed by empyema. In 20 of the patients persistence of symptoms warranted the advice of a further operative procedure. The author concludes that routine drainage not only is of doubtful value, but may be even harmful.

#### Persistence of Duodenal Ulcers after Suture of an Acute Perforation.

RICHARD LEWISOHN (*Surgery, Gynecology and Obstetrics*, February 1, 1937) has noted the infrequency of reference in the literature to continued relief of symptoms following surgical closure of a perforated duodenal ulcer. The idea so commonly held, that a perforation leads to cure of the ulcer, should life be prolonged, is entirely erroneous. Although the perforation may be of minimal size, the mucosal surface may be denuded for one or two square centimetres. In 1928 the author drew attention to a series of patients, 39% of whom suffered persistence of ulcers following suture of acute perforations. Sallick has recently reported 71% of patients examined after such an operation as having symptoms, whereas only 46% of those who could be reached by questionnaires still had symptoms. The author advocates more radical treatment for patients who have recovered from a

perforation. The author has abandoned primary gastro-enterostomy at the time of suture because of the frequent development of marginal ulcers. He concludes that partial gastrectomy is the operation of choice in those who have had a previous perforation. Diagnosis is frequently made on clinical investigation, as X rays will always show a distorted duodenal cap following suture of an ulcer.

#### Intestinal Obstruction.

J. L. DE COURCY (*The American Journal of Surgery*, March, 1937) considers that the high mortality rate from acute intestinal obstruction is due to the fact that the surgeon has too often rushed the patient to the operating room without first making a diagnosis of the cause of obstruction and without instituting suitable pre-operative treatment with a view to relief of the tension in the suffering gut. The author discusses the common causes and signs of acute obstruction of the small and large bowel and stresses the usefulness of plain Röntgenograms and of auscultation as aids to diagnosis. The main pre-operative procedures suggested are the use of the duodenal tube and of subcutaneous injections of glucose and normal saline solution. Spinal analgesia is advocated. The operative techniques employed are described.

#### Fractures of the Upper End of the Humerus.

E. L. ELIASON AND J. JOHNSON (*The American Journal of Surgery*, March, 1937), from a study of 100 cases, conclude that simple methods may be very successful in the treatment of fractures of the upper end of the humerus. Of the 100 patients, 89 required and received some form of fixation or operation. Simple fixation at the side was used in 63 cases, or 70%; the arm was dressed in abduction in 19 cases, or 21%; operation was performed in five cases and traction was used twice. Of the 56 patients whose subsequent history was followed, 89.4% had a satisfactory result. The authors conclude that simple fixation at the side is especially valuable for elderly or debilitated patients, and that it is most useful in comminuted fractures; that perfect reduction is not necessary in order to procure desired function; that it is better to treat the individual and not to be guided solely by the Röntgenogram, and that deformity does not necessarily mean dysfunction.

#### Sebaceous Cyst.

T. SESHACHALAM (*The Indian Medical Gazette*, October, 1936) describes an unusual sebaceous cyst. The tumour was the size of a millet seed. It exuded a foul-smelling discharge. When it was removed it was found to contain a coiled hair, 22.5 centimetres long. The cyst was lined with modified skin. The author states that the hair had grown from a reversed hair follicle like a hair-spring within the cyst.



## British Medical Association News.

### SCIENTIFIC.

A MEETING of the South Australian Branch of the British Medical Association was held at the Anatomy Theatre, Adelaide University, on February 25, 1937, Dr. A. F. Stokes, the President, in the chair.

#### Fractures in the Region of the Elbow Joint.

Dr. E. F. West read a paper entitled "Fractures in the Region of the Elbow Joint" (see page 773).

Dr. N. STANNUS GUNNING said that after reading Dr. West's excellent paper he found that Dr. West had covered most of the ground, especially in relation to fractures in children, and it was rather difficult to add points of interest; therefore after mentioning some observations on some of the various fractures, he proposed to pass on to the fractures in adults and to demonstrate a method of treatment for which very good results were claimed. If there was a nerve injury the question arose, what was the best procedure to adopt? The treatment for late ulnar palsy was generally accepted; but for the early cases one found that there was often no definite rule as to the time to explore the nerve. The time stated for explorations had been given as six months; but it was often found that there was a tendency to postpone operation, because of some slight improvement that might occur. But this improvement might not be present at the next examination, and so operation was put off in the hope of its return. The longer the period before exploration, especially if over nine months, the poorer the chance of recovery.

Dr. Gunning thought that the emphasis whether or not improvement had occurred should be placed upon the change in motor function and not upon changes in sensation. Therefore, if after a period of three to four months there was no improvement, that is a distinct return of motor power, the nerve should be explored. The following conditions for successful nerve suture after resection were of interest: (i) Resection must be carried so far that healthy funiculi were exposed. (ii) The nerve pattern must be restored. (iii) After suture, preferably with fine silk, the nerve should be placed in a non-bleeding bed (this also applied to neurolysis). (iv) No hematoma should remain between the ends. (v) The epineurium should be closed completely, to stop the developing neurofibrosis from straying into the surrounding tissue; if this occurred scarring took place and function was interfered with. (vi) In infected compound fractures, the operation should be postponed for at least six months; but an attempt at suture might be made. When the wound was first taken care of, a suture might fix the nerve in position, and the nerve would be more easily found later, should further operation be required.

Dr. West had stated that in operations for fractures involving the internal epicondyle he would always transpose the nerve. Dr. Gunning considered that this should be done if there was some apparent injury to the nerve; but if the nerve was smooth and apparently normal, it could be left alone. In the after-treatment the arm should be kept flexed for a longer period than usual, to allow for the complete cessation of any local reaction and the smoothing off of any callus that had formed during the natural process of repair.

With regard to the after-treatment following resection of the head of the radius, Dr. Gunning thought that active pronation and supination movements could be commenced at about the fourth day following operation unless there was some special contraindication; but these movements should be gradual at first and within the limits of pain.

Dr. Gunning went on to discuss fractures of the external condyle. He said that one might ask what comprised the external condyle. The lower end of the humerus was divided arbitrarily into an internal and an external condyle. The external condyle was made up of the external epicondyle, the capitellum, the posterior non-articular surface behind the capitellum, and what was more important, the outer third of the trochlea. Isolated fractures of the

capitellum and epicondyle were separate entities. Fracture of the external condyle was sometimes described as a fracture of the capitellum; but careful X ray examination showed that a flake of bony diaphysis had been carried away, with the capitellum separated from it by the normal clear interval of epiphyseal cartilage. In these fractures the line of cleavage found at operation was very much the same—from a point above the external epicondyle, obliquely downwards and inwards, to the lateral part of the trochlear surface. That was the interesting part of this fracture line, because it was due to the interference with the epiphyseal line in this situation that, if non-union occurred, *cubitus valgus* resulted. Separation of the capitellum alone did not cause *cubitus valgus*, because full epiphyseal growth continued over the whole of the ulnar articulation. In treatment, if displacement was slight or absent, rest in collar and cuff with the elbow in moderate flexion was sufficient; if there was some rotation only, an attempt at manipulative reduction could be made, by traction and pressure; but unless the reduction was good, the trochlear separation being nearly reduced, then open operation should be performed. In the operation, care should be taken to work behind the *brachialis anticus* muscle, to avoid injury to the musculospiral nerve. The operation should be performed as early as possible, because, firstly, it was then much easier to reduce the fragment, though it could still be difficult at times, but without causing much more trauma; secondly, it was much easier to preserve all the soft tissue attachments on the detached fragment, an important pair, because the fragment was mainly an epiphysis and so most of its blood supply through the epiphyseal junction had been lost and its only source of blood supply was through the soft tissue attachments; thirdly, if operation was delayed, the fractured surfaces lost their jigsaw-puzzle pattern and the surfaces became smoother and so did not tend to stick together as in the earlier cases; fourthly, it would be found that if the operation was delayed, the muscles attached to the external condyle had shortened considerably and some dissection must be done to get the two surfaces in apposition, thus interfering with the blood supply of the fragment.

The after-treatment was important. The danger was non-union. There was often considerable delay in union. Therefore Dr. Gunning considered that a plaster case with the arm at right angles gave the best results. The arm should be kept in position for about four weeks, X ray evidence of firm union should be obtained, and tenderness to pressure over the fragment should have disappeared before the plaster was discarded. The reasons for delayed union were mainly lack of blood supply and too early movement.

Fractures of the capitellum were rare and occurred mainly in adults. The fragment passed upwards and rotated in the bend of the elbow, thus causing a block to full flexion. Diagnosis was more difficult, as the bony points were in their normal relationship. Swelling was not very marked at first. No crepitus could be felt. The main clinical fact to note was the block to full flexion. A lateral skiagram would show up the fragment; but an antero-posterior view showed only the posterior non-articular portion and the normal lower end of the humerus, and so the fragment might be missed. Removal of the fragment was the general treatment. In a child, as the trochlear portion of the epiphyseal cartilage was not injured, *cubitus valgus* would not occur.

Dr. Gunning said that fractures at the lower end of the humerus in adults were known to be less common than in children; also the methods of treatment were much less satisfactory, and there was no definite agreement as to the method of treatment to be followed as there was in children. The elbow was a non-weight-bearing joint; therefore the essential result to be desired was movement, in other words, function. It had been generally stated that early complete restoration of anatomical outline of the joint was essential to the restoration of good function, and that early motion was undesirable because of the danger of excessive callus formation. Dr. Gunning said that he wished to show that early anatomical replacement was more or less of secondary importance, and that active motion was more desirous than the complete reposition of the displaced fragment; also that early active motion in

the manner described by him did not produce excessive callus, at least, not in that situation. There were several anatomical points of interest: first, the relation of the anterior capsule to the lower end of the humerus; secondly, the weak area of the humerus just above the line of the condyles; thirdly, the time of union of the lower epiphysis to the diaphysis, between the ages of sixteen and seventeen years, when it might be considered an adult elbow. In most fractures about the joint there was nearly always some coincident injury to the ligamentous and other soft parts. In Dr. Gunning's opinion this was probably the most important factor in the loss of function resulting from fractures in this region.

The symptoms of these fractures, excluding fractures of the epicondyle and perhaps the external condyle, were similar. Pain and great swelling appeared rapidly, and were much more pronounced than in children. The joint was held flexed, and motion in any direction was limited or absent. It was often found that early attempts at reduction by manipulation were disappointing, mainly because the swelling interfered with the reduction and the interpretation of the findings following the attempted reduction; bony landmarks were absent, and it was necessary to wait for X ray examination and then perhaps to make further attempts. The general method of treatment one saw was reduction or attempted reduction plus a plaster casing to the limb, sometimes with extensions, as in Böhler's method. The later results of such treatment were not very satisfactory. Dr. Gunning then described a method the functional results of which were said to be much better. Dr. Gunning was not prepared to advocate this alternative method. The main features of the method were: (i) reduction of swelling and oedema in a comparatively short period; (ii) continuous traction on the muscles of the upper arm to relieve muscle spasm; (iii) the use of early active movement if there was no great displacement; (iv) an attempt at manipulation under general anaesthesia about the fifth or sixth day if there was much displacement, followed then by active movement. Early active movement consisted of flexion only, the arrangement of the splint allowing the extension to be obtained by an attached cord. After X ray examination the patient was put to bed; the splint was then arranged; strapping was applied; felt pressure pads were employed if necessary; the forearm was placed in such a position that the deformity was not increased; weights were then applied. Reexamination by X rays could be made later if necessary. The period of confinement to bed was governed by the rate of disappearance of the swelling—about twelve days.

Passive motion was absolutely contraindicated and no painful movement was allowed. In certain cases operation might be required; it was best performed about the fifth or sixth day.

In conclusion, Dr. Gunning expressed his thanks to Dr. West for his opening remarks, and to the Branch for having asked him to open the discussion.

Dr. L. O. BETTS emphasized the necessity for early adequate reduction of fractures in the elbow region. Reduction should be performed without X ray examination (if this entailed delay), under a general anaesthetic. Reduction was obtained by strong traction in extension and supination, gradually bringing into acute flexion, meanwhile forcing the upper fragment backwards. If reduction was adequate, the lower fragment would be firm, with no lateral movement. Some range of movement into extension was possible without displacing the fragment. The olecranon should be well forward of the line of the shaft, but nearer its inner side. No strapping or bandages other than the cuff and collar should be used. The lowering of the sling and checking by Thomas's test were imperfectly understood. The non-use of this test after dislocation of the elbow was probably responsible for almost all the cases of *myositis ossificans*. In Dr. Betts's experience ischaemic paralysis was caused by interference with the circulation, caused by non-reduction of the fracture, and the maintenance of full flexion by strapping. In twelve cases he had seen, the fracture had not been reduced, and the typical deformity was present; eleven of the patients had been treated with the elbow in flexion, and seven of these had tight strapping (with an ulcer

over the wrist from its pressure). The median nerve was involved in six. In 1932 Sir Robert Jones had stated that the medical practitioner "was not necessarily to blame for cases of ischaemic paralysis"; but, at the same time, he stated: "Although I have used the flexed position for over forty years, I have never met with an ischaemic." Surely, then, the treatment must be at fault in most cases. It was interesting to compare the original article by Sir Robert Jones, written in 1894, advocating the treatment in acute flexion, with his last article of 1932. The treatment had not been altered after his forty years' experience. This treatment had been originally adopted by Jones because it had proved so successful when applied to old cases of stiff elbows treated by the older methods.

Extra care should be taken of these fractures in girls, as the ugly elbow resulting from imperfect reduction and treatment was a constant source of distress throughout their lives—a factor that should always be kept in mind.

SIR HENRY NEWLAND said that Dr. Betts had put his finger on the weak spot in the argument of those who condemned the flexion treatment of fractures involving the lower extremity of the humerus in the young. Those who condemned the method condemned themselves, because the elbow had been fixed in a flexed position without reduction of the backward displacement of the epiphyseal fragment. To do this was fraught with grave risk. That wise old surgeon Jonathan Hutchinson, senior, had many years before pointed out that the lower epiphysis of the humerus when displaced backwards carried with it a sleeve of periosteum. Through a rent in this sleeve the diaphysis protruded anteriorly, damaging the *brachialis anticus* muscle to a greater or less extent. To correct the displacement, traction must be applied to the epiphyseal fragment and the backward displacement reduced. Then, and only then, was the elbow joint placed in full flexion. If the displacement had not been reduced, flexion was characterized by a peculiar sense of resistance which should warn the manipulator that all was not well.

Dr. E. F. GARTRELL congratulated the speakers on their interesting exposition of the subject. It was an amazing thing that injury near a vessel as large as the brachial artery could produce reflexly such a degree of spasm as to stop the flow of blood. In addition to this occurrence, it had been shown by Leriche that the scar produced by direct traumatic occlusion of a large artery could produce reflexly considerable vasomotor spasm. Possibly these reflexes were in some way connected with Volkmann's ischaemic contracture. Leriche had shown that resection of the obliterated portion of the vessel improved the reflex peripheral vasoconstriction to a considerable degree.

Dr. DOUGLAS G. MCKAY said that, having had the opportunity of seeing many supracondylar fractures which had been unsuccessfully manipulated, and of watching recently qualified medical practitioners attempting to reduce them, he was sure that the reason for most failures was that, whilst carrying out the movement of flexion, the manipulator failed to appreciate the fact that traction must be continued. If the traction on the humerus was released, the lower fragment rode up behind the upper, and when the forearm was flexed the lower fragment was prevented from coming forward by coming in contact with the lower end of the humerus. Another point that he would like to stress was the possible danger associated with the unnecessary movement of hyperextension. Dr. McKay had seen many reductions commenced with the preliminary movement of hyperextension. It was easy to imagine that a sharp lower end of the upper fragment might cause serious damage to the blood vessels and nerves as they were stretched over the spike.

Dr. A. F. HOBBS referred to the use of skeletal traction by a transfixion wire through the olecranon in cases of supracondylar fracture of the humerus, in which great difficulty was encountered in obtaining satisfactory reduction of the deformity. He considered that, although this was seldom necessary, it was very effective in difficult cases. The patient was kept in bed, and extension was applied in a vertical direction by means of a Balkan beam, with weight and pulleys. Nursing was easy, and the patient was comfortable.



Dr. West, in reply, thanked Dr. Gunning for opening the discussion, and the other speakers for bringing forward various points.

Regarding nerve suture, he said that he preferred to use fine catgut, disliking unabsorbable material.

When operating to replace in the joint the internal epicondyle, which had been displaced, he was of the opinion that it paid in the long run to transpose the ulnar nerve as a routine. As stated in the paper, in these cases the nerve had practically always suffered damage, and there was always present the likelihood of further interference due to alteration of its groove.

He agreed that in some cases with minor displacement, fracture of the external condyle could be treated conservatively.

He was interested in the apparatus Dr. Gunning had shown, and hoped he would have an opportunity in the near future to see it in operation. He, however, could not quite reconcile his mind to early movement of the elbow joint in these cases.

With all that Dr. Betts had said he was in complete agreement. Certainly, if the taking of skiagrams before reduction necessitated any appreciable waste of time, they should be dispensed with. He agreed that in most cases of ischaemic palsy faulty reduction was apparent, and he was sure that accurate reduction was the most important factor in the prevention of this tragic complication. Sir Henry Newland and Dr. McKay had also spoken of the dangers of forcing an unreduced supracondylar fracture of the extension type into acute flexion, and he agreed that this was a vital point, which should be appreciated by all practitioners. As these three speakers had mentioned, one could tell clinically when reduction had been obtained, and then the elbow should go easily into flexion. He had stressed this in his paper, when he stated that the flexed position in which the elbow was immobilized was one in which the hand could still be pushed up another inch or so.

The patient with gangrene of the hand, mentioned in the paper, had been treated for one week before being admitted to hospital with the hand gangrenous.

Dr. West said that he had seen ischaemia in forearm fractures treated in tight plaster splints. A thorough understanding of the method and close supervision were essential when unpadded plaster splints were used.

He was interested in Dr. Gartrell's remarks upon peripheral vasoconstriction following arterial damage. This probably supplied the key to some of the little understood factors in the pathogenesis of Volkmann's ischaemia.

Dr. Hobbs had mentioned Zeno's suspension method of treating difficult supracondylar fractures; this, Dr. West thought, would be of value in certain cases.

A MEETING of the Victorian Branch of the British Medical Association was held at the Orthopaedic Section, Children's Hospital, Frankston, on March 21, 1937. The meeting took the form of a series of short lectures and clinical demonstrations by the members of the honorary surgical staff. Before the meeting took place visitors to the hospital were shown round the wards and operating theatres. They were also shown the Craft Hostel where older boys and girls received occupational instruction.

#### Tuberculous Disease of the Hip.

DR. J. G. WHITAKER showed a number of patients illustrating some phases of tuberculous disease of the hip. Dr. Whitaker pointed out that, whilst purely synovial tuberculous arthritis did occur, especially in the early stage, it was impossible to diagnose tuberculosis definitely until abnormal radiographical changes had appeared. Cases were shown illustrating the different early lesions found radiographically in tuberculous disease. Special emphasis was laid on the presence of lesions indistinguishable radiographically from Perthes's disease in some early cases and the need for caution before diagnosing Perthes's disease positively. Dr. Whitaker said that at the Children's Hospital no patient with a known tuberculous lesion of the hip had failed to react to the Mantoux test. Failure to react was therefore of greater importance than a reaction. Contact with open cases of pulmonary tuber-

culosis was an important factor in the causation of this condition. In about 50% of the cases at the Children's Hospital a history of contact was obtained. From this it naturally followed that the infecting organism was of the human type. The blood sedimentation test showed a fairly constant curve and constant changes on prolonged recumbency.

Dr. Whitaker emphasized two important points: (i) the aim in all cases should be to secure bony ankylosis; (ii) the course of the disease could best be followed by the skiagrams. Clinical signs, whilst useful, were best used in a confirmatory manner. The length of treatment before a satisfactory result was obtained was three to four years; in some cases it was longer, but in very few shorter. Dr. Whitaker drew special attention to a patient who had been intermittently treated for five years. In this case bony fixation had not been secured and some movement could be elicited; gross deformity was present, and an active state of the disease was disclosed radiographically. This case illustrated very clearly the results of non-fixation, gross deformity and progress of the disease. It was emphasized that in most cases marked destruction was present even when the patient had been adequately treated from the commencement. This was the most disconcerting feature of the disease, and the arrest of the dissolution of the joint and upward travelling of the head constituted the biggest challenge in treatment.

Dr. Whitaker said that treatment that lasted four years and in the end produced, at best, a shortened fixed hip, could not be considered ideal. This had unquestionably led to the adoption of the operative method of treatment. Dr. Whitaker demonstrated the method and laid emphasis on the need for "bivalving" plaster spicas to permit the limb to grow out of the plaster. He said that treatment by plaster spica was carried out as a rule instead of fixation in a Thomas splint, and a walking hip spica used when the condition had reached a certain stage of improvement. Various methods of extension had been employed to stop the upward march of the head; but none had been very successful. Dr. Whitaker indicated that the successful solution of this problem was the key to the conservative method of treatment. He said that two advantages were claimed for the method of operative treatment, namely: the elimination to some extent of the shortening of the limb and the reduction in the length of the treatment. The disadvantages were also quite clear, namely: dissemination, bad infection of the wound, sequestration of the graft, the performance of operation in a sea of pus, and the occurrence of operative shock. This of course applied more particularly to the intraarticular method of operating. Dr. Whitaker also showed patients illustrating these points. He went on to say that in a number of cases that had not the typical "subluxating" course, he had postponed operation until after the annual meeting of the British Medical Association. In every one of these cases there was now satisfactory healing without operation. He said that the weight of evidence would appear to be against operation in tuberculous disease of the hip in childhood, except in some of the cases in which fixation of the hip had not occurred.

Dr. Whitaker said that renal tuberculosis had not been found in as many cases at Frankston as had been observed elsewhere. Renal stone, however, promised to be a real menace, as all the conditions predisposing to stone formation were present, namely: chronic infection, high calcium intake, recumbency and stasis. Cystoscopy had been found to be difficult in these cases, owing to the varying degrees of deformity of the hip. In about 20% of cases pulmonary tuberculosis was found to be present; this was important as an indication of the systemic nature of the disease and as a guide in the use of anaesthetics. In conclusion, Dr. Whitaker pointed out that many of his observations were the result of the work of Dr. Douglas Galbraith, to whom he gratefully acknowledged his indebtedness.

#### Talipes.

DR. D. OFFICER BROWN said that *talipes equino-varus*, or congenital club-foot, constituted about 80% of all cases of congenital talipes. Hippocrates had stated that more cases of congenital club-foot could be corrected if treated



early, before great bone distortion had occurred, and advised firm bandaging from within outwards between manipulations. This was a wise observation in view of the Greeks' practice of leaving deformed babies in the cold, so that they might die, hence restricting orthopedic practice to an unpardonable extent.

For centuries, manipulators and truss-makers had treated these patients, notable among them being one Timothy Sheldrake, who, in 1798, wrote a book on club-foot, and toured England manipulating deformities and making weird splints and boots. Incidentally, he treated Lord Byron, with poor success, and, for his failure to cure him, blamed his brother, William Sheldrake, who had first treated the unfortunate lord and "made a mess of the case". In 1831 Stromeyer, of Hanover, divided a *tendo Achillis* with no great sepsis and with good results.

In 1839 W. J. Little, who had himself a paralytic talipes, went to Stromeyer and had his own *tendo Achillis* divided, learnt the method, and subsequently introduced the operation to England. This event marked an important point in the history of club-foot, whence it came more and more under the care of the surgeons, and out of the hands of the truss-makers and manipulators. It was interesting to recall that as early as 1839 Bradford wrote: "The literature of the treatment of club-foot is as a rule that of unvarying success. It is often as brilliant as an advertising sheet, and yet in practice there is no lack of half-cured or relapsed cases—sufficient evidence that methods of cure are not universally understood."

An outstanding event of the late nineteenth century (1898) was the publication by Walsham and Hughes (the latter, Dr. Kent Hughes, of Melbourne) of an epoch-making work on deformities of the foot, including a detailed review of a great deal of original work with club-foot and its treatment. In this work the view was taken that a downward and inward deviation of the neck of the talus was a primary and constant deformity, and the operative osteotomy of the neck of the talus consequently an essential part of the treatment in severe cases. Dr. Brown commented that there was still much difference of opinion as to the pathogenesis of club-foot. Specimens of very young talipadic feet were not often available for examination, and in cases of longer standing it was important to remember Wolff's law, namely, that the external shape of bone was the result of functional adaptation. Certainly in recent years, notably in England, there had been a strong swing to the view that gross changes in the shape of the bones were secondary to a primary soft-tissue deformity. Laming Evans had stated that the importance of the inversion of the neck of the talus had been grossly exaggerated.

Dr. Brown said that his own observations would lead him to support the view taken by Trethowan, and later P. Brockman and others, that the most important feature of the distorted anatomy was a congenital shortening of the calcaneo-navicular capsule, which caused the navicular bone to be brought into close contact with the *sustentaculum tali* of the calcaneus. The head of the talus should normally fit into an acetabulum formed of the navicular articular surface in front, the calcaneo-articular ligaments below, and a calcanean articular surface behind. In club-foot this acetabulum was largely obliterated, and the head of the talus dislocated. The deformity appeared to be due to a defect in the developing limb, and it seemed at least possible that an inflammatory process *in utero* might be a factor in some of these defects of development. Mechanical and traumatic factors were unimportant. Treatment should be begun in the first few days of life. Dr. Brown remarked that Albée, with a little pardonable hyperbole, used to tell his students that if at the time of labour the accoucheur found a foot presentation complicated by the presence of a congenital club-foot, corrective manipulation of the foot should be commenced before the birth of the child. Dr. Brown considered that the foot should be manipulated forcibly two or three times each week, with correction of the triple deformity of varus, equinus and adduction of the fore-foot, and the position should be maintained by the application of adhesive strapping to the over-corrected foot between manipulations. Two pieces of strapping 2.5 centimetres (one inch) wide were com-

monly used, the first passing from within outwards, under the heel, in a vertical plane, and the second passing from the medial side of the heel obliquely under the foot, and then completely encircling the fore-foot. A small pad was usually advisable on the inner aspect of the fore-foot. If forcible enough, manual manipulation without anaesthesia was quite adequate and the use of a wrench was unnecessary. The mother was encouraged to manipulate the foot daily without disturbing the strapping. After some months (usually two to six) the feet were manipulated every two to three weeks only, and plaster was used to retain over-correction.

After twelve months, subcutaneous tenotomy of the *tendo Achillis*, and sometimes the plantar fascia, might be required. When the child walked, shoes and boots were wedged on the outside, and often valgus night-shoes were applied at night. Tubby had wisely remarked that active treatment was necessary for weeks only, care for years. Dr. Brown said that after three years it was evident that some cases had resisted manipulation, and these were often the "short chunky foot" type, with poorly developed heels. In these and in some of the untreated cases about the same age, if not too severe, Dr. Brown considered that wrenching under an anaesthetic, and plaster, and subcutaneous tenotomies might produce adequate correction. More often it was advisable to attack the calcaneo-navicular region and perform an operation of the Trethowan-Brockman type. Dr. Brown said that he had found it preferable to use a single incision on the inner aspect of the foot; the external incision seemed unnecessary. A modified Steindler operation was done, the structures of the sole being peeled off the surface of the calcaneus. The upper edge of the *abductor hallucis* was then identified and traced back to its origin from the lacinate ligament. The origin was entirely separated from ligament and bone; a good view of the nerve-vascular bundle was obtained; the *tibialis posterior* tendon was identified close to the malleolus; its sheath was opened and the tendon drawn aside, or divided if necessary. The calcaneo-navicular capsule was cut freely away. The head of the talus was not evident; forcible wrenching separated the navicular bone from the *sustentaculum tali*, and the head of the talus could be seen and would come down into its proper place.

Dr. Brown remarked that it was easy to demonstrate the definite alteration in the position of the head of the talus. At the same time, the prominence on the dorsum of the foot due to the dislocated head disappeared. The inversion of the heel was as a rule well corrected with that procedure. In Dr. Brown's opinion the most troublesome aspect of the operation was the incision that was necessary on the medial aspect of the foot; the skin edges might be separated by as much as five centimetres (two inches) after correction of a badly varoid foot. This necessitated plastering with only half-correction, and often forcible manipulation under anaesthesia for a few weeks to obtain full correction before the sutures were removed. Good correction was usually obtained. In the older cases, relapsed or untreated about the age of puberty or later, the various bone operations, wedge tarsotomies *et cetera*, had a definite place, the operations of Cooke, Hoke and Hughes being the most worthy of mention. It was felt, however, that the most satisfactory procedure in these late cases was a stabilization procedure, such as that employed by Naughton-Dunne or Hoke, with removal of a sufficient wedge of bone to place the foot in good position. Dr. Brown thought that there could be little sympathy with the statement of Albée that even in young children the deformed foot should be considered from a purely mechanical standpoint, and when it was necessary to remove a wedge, or both, the surgeon should not hesitate to do either. Dr. Brown said that he felt that the surgeon should hesitate for a long time, because he was considering the mechanics of the foot. Tubby had said that his patients preferred a mobile but often unsightly foot to a tarsotomized one of better appearance.

Dr. Brown commented that the Boston review of 1907 to 1913 had shown that in 95% of cases the results of manipulation were good, and the results of operation were good in 55%. He thought that patients who had suffered

relapse were the most difficult to treat, and said that the worst of all were those who had suffered relapse after the bone had been removed.

The condition of *arthrogryphosis multiplex congenita* had been described by Stern in 1923. In addition to talipes of gross degree, the patients with this condition had a general lack of muscle tissue in all limbs, with multiple deformities. A case of *arthrogryphosis multiplex congenita* was shown, and several cases of *talipes equino-varus* illustrating the results of manipulative and operative treatment.

#### Congenital Dislocation of the Hip.

Dr. J. B. COLQUHOUN said that he had chosen the subject of congenital dislocation of the hip for two reasons: first, because treatment in the early cases was so much more successful than in the late cases, and, secondly, because the condition could be diagnosed at a much earlier age than it was generally believed. He said that the credit was due to Professor Vittoria Putti, of the famous *Istituto Ortopedico Rizzoli*, the University of Bologna, for recognizing and treating congenital dislocation of the hip in infancy. Dr. Colquhoun said that it had been his good fortune to attend a joint meeting of the American and British Orthopedic Associations in London in 1929, when Putti first showed his results. Three years later, in 1932, Putti showed further cases and later results of the 1929 cases. Perhaps it was only natural that Putti should have seen cases of congenital dislocation of the hip in infancy, working as he did in that part of Italy where the condition was so common; an increasing number of cases had been diagnosed in Bologna each year since then. Dr. Colquhoun remarked that all babies born after a difficult labour or following a breech presentation or showing any congenital deformity or history of congenital dislocation of the hip were X rayed in the first few months of life. In this way many cases had been diagnosed. Diagnosis by radiography was not easy at this stage, because the complete picture as seen after walking was not present. Dr. Colquhoun thought that the following points might be of help in arriving at a diagnosis. In the normal pelvis at one month the epiphysis for the femoral head had not begun to ossify. By six months, however, it was well developed and showed on a skiagram. In congenital dislocation of the hip the epiphysis was late in appearing, and it was smaller than its fellow; it was seen at a higher level than the epiphysis of the other side. Before the appearance of the epiphysis a diagnosis could be made by X rays if the acetabulum was not so well developed on the affected side, and if the upper femoral metaphysis was higher and further laterally than the unaffected one. Dr. Colquhoun thought that if all babies with a history such as was outlined were examined radiographically as a routine, certain cases would be discovered in Melbourne, and that medical practitioners would become skilled in recognizing the condition clinically. Experienced clinicians could diagnose the condition without the aid of skiagrams if certain signs were present. First, there was abnormal increase in the range of lateral rotation of the thigh—lateral rotation and abduction; secondly, in congenital dislocation of the hip the pelvis of the child looked like an adult female pelvis (Perkins); thirdly, when the baby was placed on its back on a hard table with both hips and knees flexed to a right angle, the knee on the affected side was appreciably lower than the other (Souttar's sign). Dr. Colquhoun considered the last the most valuable sign of all. Putti had indisputably shown that in those cases in which diagnosis was made before the child walked, the dislocation was invariably reduced by continued abduction, and the end-result was indistinguishable from normal. In view of the failures obtained after walking, Dr. Colquhoun thought that this was a challenge to medical practitioners to make the diagnosis more frequently at this desirable stage.

Dr. Colquhoun said that time did not permit more than a brief mention of the difficulties in the management of these cases. He said that as the child was not yet trained, soiling of the dressings and bandages took place at regular intervals, making the use of plaster of Paris almost impossible. Putti had started with a triangular urine-proof pad to which he strapped the baby in the position of abduction

of both legs, with medial rotation. This, however, had been given up. An adjustable abduction splint was now used. Dr. Colquhoun described a case from his own experience. A small ham-shaped splint of wood was bandaged along the posterior aspect of the knee joint over abundant cotton wool on both sides. Over this the abduction splint was fastened. Each day it was adjusted, one hole at a time, until both legs were abducted 90°. When this position was obtained it was seen that the hip was reduced; the position was maintained for three months. Thereafter abduction was reduced gradually until both legs were parallel. This stage occupied one month. Dr. Colquhoun thought that the case was interesting, as a diagnosis had been made because the father thought there was something amiss with the other leg. Owing to adduction of the right or dislocated femur the left leg was held in abduction and the father asked for a radiograph of the pelvis. The abduction was noticed in the ninth week, but a radiograph was not taken until the eleventh week. Because of the early age it was decided that the treatment should be delayed until the baby was gaining weight satisfactorily; at the age of five months abduction was begun. After one month both legs were abducted beyond 90° and skiagraphy showed reduction of the dislocation. Subsequent skiagrams showed commencing ossification of the capital femoral epiphysis in the acetabulum.

Dr. Colquhoun said that for many years to come the majority of cases would not be diagnosed until after walking. One heard in the out-patient department that the mother had noticed a limp, but when her doctor was consulted he had dismissed the case as one of imagination. While much that mothers tell one should rightly go in one ear and out the other, whatever a mother notices in her child should be investigated thoroughly before being dismissed as being unimportant. Dr. Colquhoun considered that between the ages of one and four years, when dislocation was diagnosed, manipulation still offered, in skilled hands, the best end-result; further, only by manipulation could a perfect result be obtained. Dr. Colquhoun mentioned the modern method of manipulation, the Denuce method. Under deep general anaesthesia, the adductor muscles were massaged and stretched gently and slowly until the affected limb could be made to lie on the table with the hip joint abducted laterally, rotated and flexed, through 90°; this might take twenty minutes. Tenotomy, or forcible disruption of the origin of the adductor muscles was not necessary, and, in his opinion, was bad practice. When this position was obtained manipulation was attempted. The affected leg was flexed at the hip and knee, and the knee was taken to the opposite axilla. By pushing distally with one hand and taking the limb close to the abdomen with the other hand, the surgeon gradually assisted the head of the femur over the rim of the acetabulum; reduction was accomplished with an audible click when right-angled abduction was obtained.

Dr. Colquhoun remarked that in unilateral cases both legs were encased in plaster of Paris with both hips flexed, abducted and laterally rotated 90°, and both knees were flexed to 90°, the plaster extending from the lower ribs to the toes. The plaster was cut away in a special manner to render nursing easier and to enable a good skiagram to be obtained of the reduced hip. Dr. Colquhoun kept his patients in this "frog" position for two months, then the hip was brought down to 45° of abduction and encased in a single spica. After one month a Frankston walking iron was applied and the child became ambulant. At the end of six months all retentive apparatus was removed and the child was allowed to go home. He said that since he had adopted this routine no case of redislocation had occurred in his experience. In this way the period in hospital had also been reduced. The care of a patient with congenital dislocation of the hip in plaster at the age of from one to three years was beyond the capacity of the average mother, and Dr. Colquhoun urged that all such patients should be sent to a hospital where the staff was trained and skilled in dealing with them.

#### Scoliosis and other Congenital Deformities.

Dr. E. E. PRICE said that it was not possible nor desirable on such an occasion to discuss all the problems germane to the subject of scoliosis. He proposed therefore to



mention first the unusual and interesting features of scoliosis from the point of view of aetiology, and secondly, the treatment employed at the Children's Hospital, and the results in two of the cases, with some suggestions for the future.

Dr. Price's first patient was a female, aged thirteen years and four months, who was said to have been born three months premature and to have weighed less than one pound at birth. The curvature was noticed at birth and was quite distinct at six months. The patient did not walk until she was four years of age. Dr. Price said that she had had treatment, but that the deformity was increasing. In March, 1937, she was admitted to hospital with very gross scoliosis. The main curve was to the right in the dorsal region with compensatory curves above and below, the lower one being so gross that the pelvis was tilted upon the left side, causing her to walk on her left toes. She used her left arm as a prop, with her hand on the prominent ilium; rotation and deformity of the thorax were also gross. There had been no shortening of the legs, though she was very undersized for her age; mentally she was above the average. Dr. Price said that the muscles showed generalized hypotonia, and in the face of this it was difficult to estimate the degree of partial paralysis if any. The flat muscles of the right upper quadrant of the abdomen bulged and the trunk flexors were unable to support the weight of the legs. The nervous system was also involved. The central nervous system and conducting tracts were normal; but the skin segments from the first thoracic to the second lumbar were anaesthetic to pain and touch, the area extending roughly from the groins to the clavicle and inner aspect of the arms; deep pressure was not affected. Dr. Price thought that the disturbance of sensation had been noted very early, but there was good reason to believe that it had increased. The aetiology of the curve was very much a matter of conjecture. Dr. Price said that the next three patients comprised all the female children of one family who all had: severe structural scoliosis, without obvious cause, noticed during babyhood; eye defects, characterized by gross strabismus and diminished range of ocular movement, associated with a convergent strabismus. The fundi were normal. One boy of intermediate age was unaffected. The family history of the father was quite clear, but the children had a marked resemblance to the mother physically and temperamentally, and all seemed a little below normal mentally. Unfortunately the mother's family was untraceable, though no sign of scoliosis had been noticed in the known members. These cases had been regarded as being associated with a familial defect inherited through the mother and affecting the females only, though proof was lacking.

The eldest child of the family, D.J.C., aged ten years and four months, was first seen in February, 1935, with a right cervical left dorso-lumbar curve of moderate severity with fixed rotation; the severity of this curve was estimated by photographs, skiagrams and clinical measurement. Dr. Price said that there were no other significant clinical changes apart from the eye defects.

The next child, N.M.C., aged seven years and eight months, had been first seen in February, 1935, with a right cervical left dorso-lumbar curve of severity greater than her elder sister's and with fixed rotation estimated as 45° at the maximum. Her eyes were more obviously affected than those of her sisters; but in addition she had a tight left sterno-mastoid muscle, which had been treated by myotomy before other treatment was started.

The youngest child, D.C., aged one year and nine months, had been first seen in January, 1936, at the age of seven months, when she had a slight total right scoliosis, which had been noticed one month previously, when she had first been able to sit up. She had eye changes and the left pupil was bigger than the right; but both reacted. There was no sterno-mastoid tightness nor any congenital lesion in the vertebrae.

In speaking of the treatment, Dr. Price said that, whatever the cause of the curve, there were two separate points to be considered: the improvement of the existing curve and the maintenance of the best position. He said that it was with the first point that the lecture was con-

cerned, and in particular those cases with fixed deformity and rotation. He observed that there were three main principles in the correction of the curve: gymnastics, lateral corrective force and longitudinal corrective force. He said that these principles had all been available thirty years ago, and whatever progress might be claimed had been in the discarding of unsatisfactory techniques and the amalgamation of the three principles in varying proportions. The treatment of scoliosis differed considerably in different parts of the world. Risser and his associates, in New York, used turnbuckle jackets. Kleinberg, of the same city, employed continuous traction and lateral pulls. McCrae Aitken, in Oswestry, used a modified Abbott's frame technique. Bankart, in London, used Fisher beds. On the Continent Galliazi had worked out a complicated machine providing torsion. The treatment that would be illustrated contained nothing original, and all that could be said of it was that it was the method adopted in these two cases at the hospital. The treatment adopted for the two older patients was a combination of suspension, gymnastics and rest in a Bradford frame. The patient was suspended from the axillae and the head from a bar of wood like a coat-hanger. The straps were adjustable, so that the varying degrees of tension could be taken through the neck, and the whole appliance was supported from an overhead pulley. The patient was suspended with the buttocks clear of the bed for as long as she could stand it. The time of suspension increased from half an hour, at the beginning of treatment, to two and a half hours later, with a total daily period of six hours. This was the Fisher bed principle. Each day the patient went to the gymnasium for exercises there and in the pool, where the following were carried out: posture holding with the aid of a mirror; general exercises to develop the physique generally; special exercises to strengthen muscles on the convex side of the curve, and manipulations to correct these. When not otherwise occupied the patient rested recumbent on a slightly convex Bradford frame. This prevented scoliotic attitudes during sleep and tended to correct the associated backward projection of the ribs, which produced an appearance of kyphosis. Dr. Price said that photographs of the patient erect, back and front, and bending forward were taken. A string was stretched between the *vertebra prominens* and the natal cleft and was taken as marking the average mid-line. The distance of the spine from this line was measured at various points, and these distances were plotted as abscissae against the number of vertebrae as ordinates. In this way a curve representing the shape of the spine was obtained. Skiagrams, which were used to estimate the angle of the main curve by the method described by Risser, were obtained. In the skiagram the centres of three vertebral bodies were selected and marked, one at the summit of the curve and the others the first and last affected. The angle thus formed was measured and its supplementary angle was taken as a measure of the angle of the curve.

Dr. Price said that the eldest child he had shown had had treatment for ten months, and at the end of that time there was no alteration in the angle of the primary curve (32° instead of 33°); but the apex of the curve had been brought one inch nearer the mid-line by increase of the compensatory curve. The photographs showed improved symmetry and balance and, what was more remarkable, a very notable improvement in the rotation. The next child had had thirteen months' treatment, at the end of which the angle had decreased from 53° to 42° and the apex had altered from 6.25 centimetres (two and a half inches) at the ninth thoracic to 4.0 centimetres (one and three-fifths inches) at the eighth thoracic vertebra, without any increase in the compensatory curves. The photographs showed an improvement in symmetry. Dr. Price explained that this showed that more could be accomplished when the patient was younger. He said that in the case of the baby an opportunity for prophylaxis was provided. She had been placed on a Thomas double hip splint with a head-piece and modified with two lateral bars to carry three slings. These slings fixed the hips and pelvis on the one hand, pulling in the same direction, while the third pulled against these over the



apex of the curve; this appeared to be holding the curve. When the baby reached the age of about two years it was proposed to use plaster jackets and to allow her to walk. He said that at the conclusion of the hospital period of treatment the improvement was maintained by means of plaster jackets. At first and in the severe grades these were not split; but later they might be split and removed for exercises with a view to discarding them. Opinions varied as to the ultimate stability of the curve. Risser maintained that increase did not occur when growth was complete; but this seemed a dangerous statement to rely upon. Kleinberg stressed the importance of discontinuing support very gradually and with careful observation, and this was the view adopted at the Frankston orthopaedic branch of the Children's Hospital.

Dr. Price said that the traction was interrupted for several hours during sleep and was not regarded as ideal. The aim now was to obtain continuous traction by means of a head-piece and pelvic corset and continuous lateral pressure by canvas bands. This was obtained by a modification of the convex Bradford frame, and was the method used by Kleinberg, of New York. It was not to be inferred that all patients required treatment in hospital; on the contrary, most patients could be treated while ambulant by whatever means the surgeon was pleased to employ, such as physiotherapy, corrective jackets, or merely retentive jackets. The severely affected patient was hardly benefited by these means, and it was with the idea of seeing what correction could be obtained in these severe cases that these patients had been, somewhat experimentally, subjected to their prolonged treatment. All would admit improvement, many might say that it was not worth the trouble or that the result could have been obtained by easier means; but Dr. Price felt encouraged to try it again, and more enthusiastically, with children who had still a large growth capacity, that was to say, girls well below fourteen years of age and boys well below sixteen years of age. With continuous traction and lateral pulls the recumbent period might also be expected to be less.

#### NOMINATIONS AND ELECTIONS.

THE undermentioned has applied for election as a member of the Western Australian Branch of the British Medical Association:

Phelan, David Beattie, M.B., B.S., 1933 (Univ. Melbourne).

#### Correspondence.

##### LABORATORY FACILITIES AT OBSTETRICAL HOSPITALS, IN SYDNEY.

SIR: Dr. Burton Bradley's letter raises many issues that require careful consideration before his exhortation "strictly enforce the edict against covering by the usual penalty" is carried out. In many laboratories there are several Bachelors of Science doing most excellent work in the form of chemical pathology and bacteriology. In such cases these people have usually passed chemistry, Part III, of the science course, and may have a much better knowledge of chemistry than the medical man under whom they work, whose ignorance on the subject they may very well have to "cover". In the medical course, as a rule, chemistry, Part I, is the basis on which the medically qualified biochemist builds.

Again, science graduates make excellent hospital bacteriologists and are extremely keen and interested in the work. During the ten years of one of us (W.J.P.) at the Baker Institute no young medical man of parts has come and expressed a desire to become a bacteriologist, while several young Bachelors of Science, women, have taken

the keenest interest in the subject. I trust Dr. Bradley does not think that Bachelors of Science practising chemical and bacteriological pathology are to be regarded as undesirable, unqualified practitioners.

He feels also that the laboratory man should make contact with the patient. This is rarely necessary. The clinician can make blood smears and take blood for blood urea estimations and the like, so that it seems to us undesirable for the laboratory worker to examine the patient to ascertain if his findings fit into what would be expected in the particular clinical condition. If examinations in the laboratories are made accurately, that is all that is required. Withholding of reports because the pathologist believes they do not fit in with his estimate of the clinical condition is very unfair to the practitioner in attendance. Such apparently abnormal findings may throw very essential light on an obscure case.

Again, surely the microscopical diagnostic work of the pathologist—histological sections, blood films, urines, smears *et cetera*—can and should be performed without his personal inspection of the patient. His task of microscopical diagnosis is one which demands close application and life-long experience, without his wasting time seeing patients. Certainly there should be close contact between clinician and pathologist, and both will benefit by a constant exchange of their experiences and views; but this happy collaboration and mutual benefit can be attained without the clinician ever looking down a microscope or the pathologist ever using a stethoscope or palpating an abdomen.

Yours, etc.,

WILLIAM JAS. PENFOLD,  
Director of the Baker Institute  
of Medical Research.

RUPERT A. WILLIS,  
Pathologist of the Alfred Hospital.

Alfred Hospital,  
Commercial Road,  
Pahran, S.I.,  
May 1, 1937.

#### Medical Prizes.

##### THE STAWELL MEMORIAL CLINICAL PRIZE.

THE Stawell Memorial Clinical Prize, which consists of a money award of £40, is open for competition.

The purpose of the fund from which the prize is given is to commemorate appropriately the memory of Sir Richard Stawell, the late President-Elect of the 103rd annual meeting of the British Medical Association, and his great influence in the clinical teaching of medical students and young graduates. Donations to establish the fund were received from members of the medical profession and others, and to it was added a grant by the executive of the 103rd annual meeting.

The following are the conditions governing the first award:

1. The memorial shall take the form of an essay, and competition shall be open to Australian graduates of not more than three years' standing on August 1, 1937.
2. The subject of the essay upon which the prize shall be awarded is "The Clinical Significance of Pathological Changes in the Ocular Fundus".
3. The work submitted must be based on personal observations and experience collected by the candidate in medical practice, and a high order of merit is required.
4. The trustees reserve the right, if no essay is entered of sufficient merit, to withhold the award.
5. Essays must be in the hands of the Trustees, care of the Medical Secretary, British Medical Association (Victorian Branch), 426, Albert Street, East Melbourne, C.2, not later than June 1, 1937.

6. The prize shall be awarded at the Australasian Medical Congress (British Medical Association), Adelaide, August 23 to 28, 1937.

7. No study or essay that has been published in the medical Press or elsewhere will be considered eligible for the prize.

8. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Trustees on any such point shall be final.

9. Each essay must be typewritten or printed, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto, in which envelope must be enclosed the candidate's name and address.

10. The Trustees reserve the right to publish the essay for which the prize is awarded in THE MEDICAL JOURNAL OF AUSTRALIA.

11. Further inquiries relative to the prize should be addressed to the Medical Secretary, British Medical Association (Victorian Branch), 426, Albert Street, East Melbourne, C.2.

C. H. DICKSON,  
Medical Secretary, British Medical  
Association (Victorian Branch).

## University Intelligence.

### THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on May 3, 1937.

The degree of Bachelor of Surgery (B.S.) was conferred on Mr. Bruce Goodwin Hill.

The following appointments were approved: Dr. J. L. Shellshear as Research Professor in the Department of Anatomy for 1937; Mr. W. A. Grainger, B.D.S., as Lecturer in Ceramics in the Faculty of Dentistry; Mr. C. A. Gibb, B.A., as Assistant Lecturer in Psychology; Mr. A. J. Brown as Vernon Memorial Lecturer in Town Planning for 1937; Mr. K. H. McConnel, B.Arch., as Lecturer in Acoustics.

On the recommendation of the Professorial Board, the Senate decided to admit the following to the degree of Doctor:

Doctor of Medicine (M.D.): Mr. F. W. A. Clements, M.B., B.S.

Doctor of Science (D.Sc.): Miss Lilian R. Fraser, M.Sc., and Assistant Professor G. H. Briggs, B.Sc., Ph.D.

Scholarships and fellowships were awarded to the following:

Walter and Eliza Hall Medical Research Fellowship: Mr. F. H. Mills, M.B., B.S.

Walter and Eliza Hall Agriculture Research Fellowship: Mr. W. T. Atkinson, B.Sc.Agr.

The following were appointed as Research Workers for 1937:

Commonwealth Research Fellow in Physics: Mr. S. E. Williams, M.Sc.

Commonwealth Research Scholars: Mr. R. G. Giovanelli (Physics), Mr. D. M. Henderson (Physics), Mr. D. Gilmour (Zoology).

Carnegie Research Assistant in Town Planning: Mr. G. C. Cullis-Hill.

Mr. Arthur M. Eedy, Rev. Canon Garnsey and Dr. F. A. Maguire were appointed as representatives of the Senate on the Sydney University Sports Union. Professor Tasman Lovell has been appointed Acting Dean of the Faculty of Arts during the absence, owing to ill-health, of Professor F. A. Todd.

The following were reappointed as members of the Sydney University Appointments Board: Professor R. C. Mills, Professor J. C. Earl, Professor W. A. Miller and Professor Vonwiller (during the absence of Professor Earl).

## Proceedings of the Australian Medical Boards.

### VICTORIA.

A MEETING of the Medical Board of Victoria was held on April 7, 1937.

Applications for registration received from W. Hawksworth and A. K. Tulloch, M.B., Ch.B., New Zealand, were deferred for consideration at the next meeting, as in neither case had one month elapsed since notice of intention to apply was given.

An application made by Gerald Douglas Broome for the restoration of his name to the medical register under the provisions of Section 9 of the *Medical Act*, 1928, was granted.

The Board refused an application received from Abraham Bertram Cohen for the restoration of his name to the register under the provisions of Section 6 of the *Medical Act*, 1933.

The deaths of the following registered practitioners were reported: John Kirkpatrick, Harold Cranwell Aloysius Haynes and James Landells Blakie.

Solicitors acting on behalf of Anna Lewin made a request that the reasons for the refusal of the Board to register that applicant be stated in writing. A draft reply for submission to the Crown Solicitor was adopted.

Regarding an inquiry, the secretary was instructed to reply that an Italian qualification representing a course of study of less than five years in that country was not registrable.

Notification was received from the Acting Registrar, University of Melbourne, that four candidates were eligible to have degrees of M.B., B.S. conferred on them on April 10, and tentative arrangements were made to register these graduates on April 22, provided applications were received at an early date.

It was decided to request the Chief Commissioner of Police to seek a review of the case in which proceedings against William A. Hill under the provisions of Section 17 of the *Medical Act*, 1928, were dismissed at the Eltham Court of Petty Sessions. The information was laid by the Police Department.

Copies of a *précis* of a statement regarding the position of medical refugees who applied for permission to reside in the United Kingdom, which was made in the House of Commons on April 2, 1936, by the Under-Secretary of State, were received and circulated.

Instructions were given to request the General Medical Council to supply information as to the period of deregistration generally imposed upon practitioners whose names are removed from the medical register under the penal provisions of the law in the United Kingdom.

## Corrigendum.

### LIST OF MEMBERS.

THE Secretary of the South Australian Branch of the British Medical Association has written stating that by an oversight the name of Dr. D. R. W. Cowan was omitted from the list of members of the Branch Council.

### Books Received.

- THE METABOLISM OF LIVING TISSUES**, by E. Holmes, M.A., M.D.; 1937. Cambridge: The University Press. Crown 8vo, pp. 245, with illustrations. Price: 7s. 6d. net.
- CATARACT: ITS PREVENTIVE AND MEDICAL TREATMENT, FOR SPECIALISTS, GENERAL PRACTITIONERS AND STUDENTS**, by A. E. Davis, A.M., M.D.; 1937. Philadelphia: F. A. Davis Company. Demy 8vo, pp. 172. Price: \$3.00 net.
- THE LUNG**, by W. S. Miller; 1937. London: Baillière, Tindall and Cox. Royal 8vo, pp. 223, with illustrations. Price: 34s. net.
- HERTZLER'S MONOGRAPHS ON SURGICAL PATHOLOGY: SURGICAL PATHOLOGY OF THE THYROID GLAND**, by A. E. Hertzler, M.D.; 1936. Philadelphia: J. B. Lippincott Company. Medium 8vo, pp. 316, with 238 illustrations.
- DISEASES OF THE NOSE, THROAT AND EAR: A HANDBOOK FOR STUDENTS AND PRACTITIONERS**, by I. S. Hall, M.B., Ch.B., F.R.C.P.E., F.R.C.S.E.; 1937. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 438, with illustrations. Price: 10s. 6d. net.
- THE PHYSIOLOGICAL BASIS OF MEDICAL PRACTICE**, by C. H. Best, M.A., M.D., D.Sc., F.R.S., F.R.C.P., and N. B. Taylor, M.D., F.R.S., F.R.C.S., F.R.C.P., M.R.C.S., L.R.C.P.; 1937. London: Baillière, Tindall and Cox. Medium 8vo, pp. 1705, with illustrations. Price: 45s. net.

### Diary for the Month.

- MAY 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- MAY 26.—Victorian Branch, B.M.A.: Council.
- MAY 27.—New South Wales Branch, B.M.A.: Branch.
- MAY 27.—South Australian Branch, B.M.A.: Branch.
- MAY 28.—Queensland Branch, B.M.A.: Council.
- JUNE 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- JUNE 2.—Western Australian Branch, B.M.A.: Council.
- JUNE 2.—Victorian Branch, B.M.A.: Branch.
- JUNE 3.—New South Wales Branch, B.M.A.: Clinical Meeting.
- JUNE 3.—South Australian Branch, B.M.A.: Council.
- JUNE 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- JUNE 11.—Queensland Branch, B.M.A.: Council.
- JUNE 15.—New South Wales Branch, B.M.A.: Ethics Committee.
- JUNE 16.—Western Australian Branch, B.M.A.: Branch.
- JUNE 17.—New South Wales Branch, B.M.A.: Clinical meeting.
- JUNE 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.

### Medical Appointments.

Dr. F. D. Burke has been appointed Public Vaccinator at Northcote, Victoria.

Dr. H. R. H. N. Oaten has been appointed Honorary Anaesthetist to the Mount Gambler Hospital, South Australia.

Dr. J. M. Moray-Lawrence has been appointed Third Assistant Medical Superintendent at the Hospital for the Insane at Goodna, Queensland, pursuant to the provisions of *The Public Service Acts, 1922 to 1924*, and *The Insanity Act of 1884*, of Queensland.

### Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xiv to xvi.

**CHILDREN'S HOSPITAL (INCORPORATED), PERTH, WESTERN AUSTRALIA:** Junior Resident Medical Officers.  
**INSPECTOR-GENERAL OF MENTAL HOSPITALS, SYDNEY, NEW SOUTH WALES:** Honorary Psychiatrists.  
**MOOROOPTA BASE HOSPITAL, MOOROOPTA, VICTORIA:** Junior Resident Medical Officer.  
**STATE PUBLIC SERVICE BOARD, QUEENSLAND:** Medical Superintendent.

### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmuir United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY Hospital are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 172, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

### Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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